SLV-X717ME/X717PS/X717SG/X817ME/X817PS/X817SG/ X827AS/X827MN/X827NZ/X837AS/X837ME/X837MN

RMT-V195D/V198D/V204

SERVICE MANUAL

Australian Model
SLV-X827AS/X837AS

New Zealand Model
SLV-X827NZ

ME Model
SLV-X717ME/X717SG/X817ME/ X817SG/X837ME

E Model
SLV-X717PS/X817PS/X827MN/ X837MN

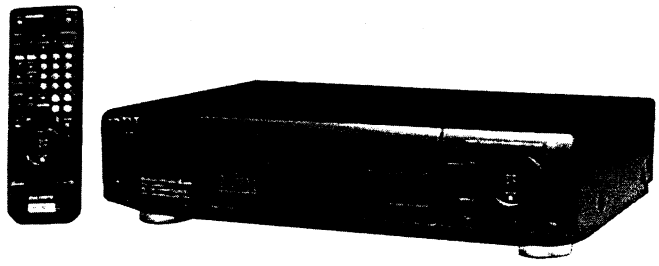

Photo : SLV-X837MN

VHS

H MECHANISM

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS Ⅳ for MECHANICAL ADJUSTMENTS. (9-973-623-11)**

SPECIFICATIONS

System

Channel coverage
- VHF
  - AS0 to AS12, AS5A, AS9A (SLV-X827AS/X837AS)
  - NZ1 to NZ11, R1 to R12 (SLV-X827NZ)
  - R1 to R12, E2 to E12 (SLV-X717/X817)
  - R1 to R12 , E2 to E12, NZ1 to NZ9 (SLV-X827MN/ X837ME/X837MN)
- UHF
  - AS28 to AS69 (SLV-X827AS/X837AS)
  - E21 to E69 (SLV-X827NZ)
  - E21 to E69, R21 to R69 (SLV-X717/X817/X827MN/ X837ME/X837MN)
  - CATV S01 to S05, S1 to S41

RF output signal
- UHF channels
  - 28 to 69 (SLV-X827AS/X837AS)
  - 21 to 69 (EXCEPT SLV-X827AS/X837AS)

Aerial out
- 75-ohm asymmetrical aerial socket

Inputs and outputs

LINE-1 IN and LINE-2 IN
- VIDEO IN, phono jack (1 each)
  - Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
- AUDIO IN, phono jack (2 each)
  - Input level: 327 mVrms
  - Input impedance: more than 47 kilohms

LINE OUT
- VIDEO OUT, phono jack (1)
  - Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
- AUDIO OUT, phono jack (2)
  - Standard output: 327 mVrms
  - Load impedance: 47 kilohms
  - Output impedance: less than 10 kilohms

General

Power requirements
- 110 -240 V AC, 50/60 Hz (EXCEPT SLV-X827AS/ X827NZ/X837AS)
- 220 – 240 V AC, 50 Hz (SLV-X827AS/X827NZ/X837AS)

Power consumption
- 19 W (SLV-X717/X817)
- 20 W (SLV-X827AS/X827NZ/X837AS)
- 22 W (SLV-X827MN/X837ME/X837MN)

Operating temperature
- 5°C to 40°C

Storage temperature
- –20°C to 60°C

Dimensions
- Approx. 430 × 109 × 321 mm (w/h/d) including projecting parts and controls

Mass
- Approx. 4.5 kg (SLV-X717/X817/X827)
- Approx. 4.7 kg (SLV-X837)

Supplied accessories

Remote commander (1)
R6 (size AA) batteries (2)
Aerial cable (1)
Audio/video cable (3-phono to 3-phono) (1)

Design and specifications are subject to change without notice.

VIDEO CASSETTE RECORDER

MICROFILM

SONY®

DIFFERENT SPECIFICATIONS

SPECIFICATIONS \ MODEL		SLV-X717			SLV-X817			SLV-X827			SLV-X837		
		ME	PS	SG	ME	PS	SG	AS	NZ	MN	AS	ME	MN
VIDEO SYSTEM	NTSC 3.58	REC/PB			REC/PB			—		REC/PB	REC/PB		
	NTSC 4.43	REC/PB			REC/PB			PB		REC/PB	REC/PB		
	PAL	REC/PB			REC/PB			REC/PB			REC/PB		
	MESECAM	REC/PB			REC/PB			—		REC/PB	—	REC/PB	
REC MODE	NTSC	SP/EP			SP/EP			—		SP/EP	SP/EP		
	PAL	SP/LP			SP/LP			SP/LP			SP/LP		
PLAY MODE	NTSC	SP/LP/EP			SP/LP/EP			SP/LP/EP			SP/LP/EP		
	PAL	SP/LP			SP/LP			SP/LP			SP/LP		
AUDIO		MONO			HiFi			HiFi			HiFi		
TUNER	SYSTEM 1	BG			BG			BG			BG		
	MPX 1	—			—			ZWEITON		NICAM, ZWEITON	ZWEITON		NICAM, ZWEITON
	SYSTEM 2	DK			DK			—		DK	—		DK
	MPX 2	—			—			—		—	—		—
RF MOD. SYSTEM		K/G			K/G			G		K/G	G		K/G
G-CODE SYSTEM		—			—			○			○		
INDEX SEARCH		—			—			○			○		
AUDIO DUBBING		○			○			—			○		
DUAL MODE SHUTTLE		○			—			—		○	○		
REMOTE COMMANDER		RMT-V198D			RMT-V198D			RMT-V204			RMT-V195D		

PRINTED WIRING BOARD USED ON EACH MODEL

SLV-X717/X817	SLV-X827/X837
DM-65	DM-63
HI-50	HI-48
MA-291	MA-290
MF-303	MF-302
RP-220	RP-218

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270°C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

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SERVICE NOTE

1. HOW TO RETURN THE PINCH ROLLER, GUIDE ROLLER AND ELEVATOR CAM TO STOP MODE

1) Remove the VHS MD assembly from the machine. (Refer to the item 2-5. Removal.)
2) Rotate the worm gear-1 of the cam motor beneath the MD assembly in the direction arrow Ⓐ using a screw driver tip.

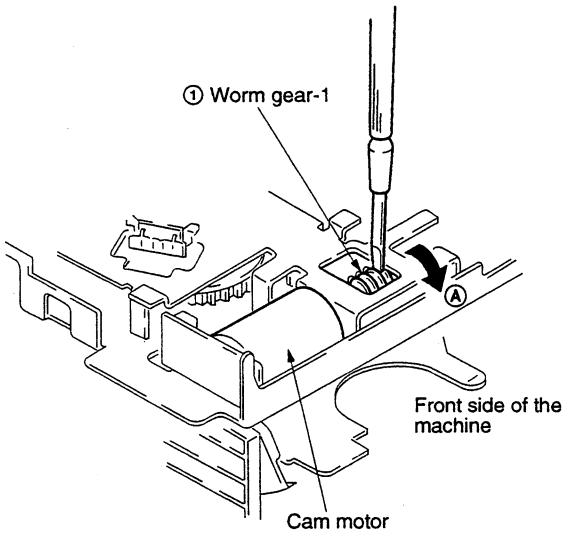


Fig. 1

2. HOW TO RETURN A TAPE INTO CASSETTE HALF

A tape can be rewound into a cassette half by rotating the flywheel-1 of the capstan motor in the direction of Ⓐ with hand.

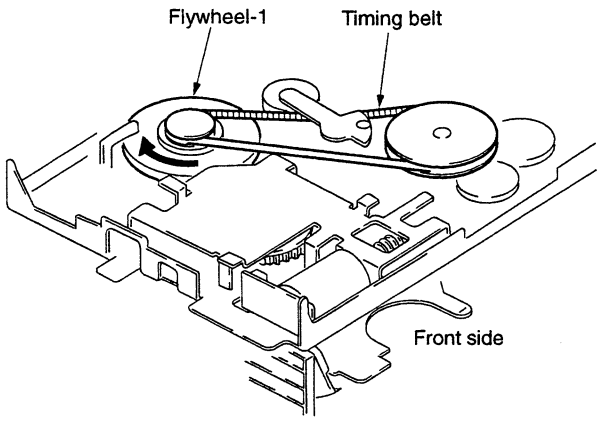


Fig. 2

3. HOW TO REMOVE A CASSETTE FROM A MACHINE IF A CASSETTE IS LEFT IN A MACHINE IN TROUBLE

Execute the item 2, and keep rotating the flywheel-1.

When executing section 1 to 3, take care that a tape slack should not be caught by a mechanism or a tape should not be damaged.

4. HOW TO REMOVE DRUM ASSEMBLY

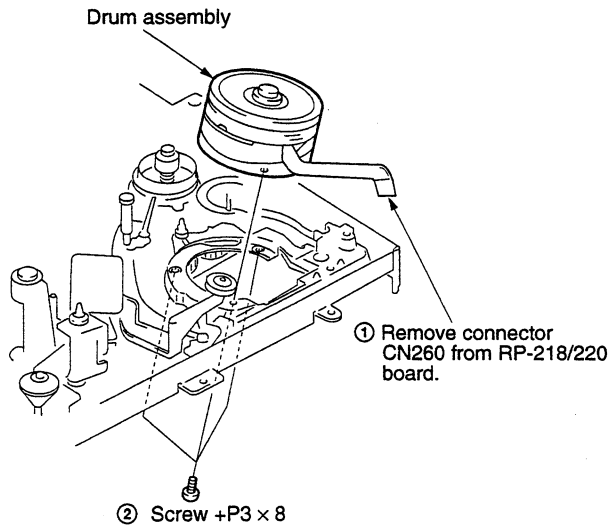


Fig. 3

5. HOW TO REPLACE A ROTARY UPPER DRUM (EXCEPT SLV-X717)

5-1. HOW TO REMOVE A ROTARY UPPER DRUM

1) Remove screw ① (+P3×8) and remove the ground shaft assembly ②. (Refer to Fig. 4.)
2) Remove soldering which is marked by arrow and remove the rotary upper drum board completely.
3) Remove two screws ③ (PSW3×8) and remove the rotary upper drum in the direction of Ⓐ. (Refer to Fig. 5.)
   If removal is difficult, remove it while rotating it slowly.

Note: If removal is difficult, check again if soldering is removed completely.

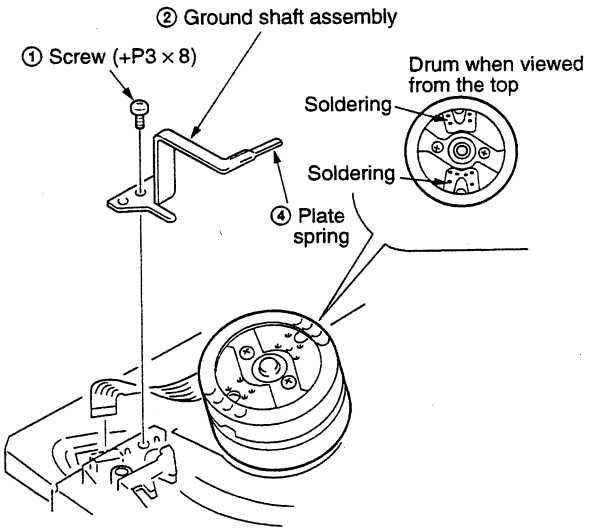


Fig. 4

5-2. HOW TO ATTACH A NEW ROTARY UPPER DRUM

1) Pay attention so that finger print or like must not be put when inserting a new upper drum into lower drum.
2) Align ➡ mark of the rotary upper drum board with the ⇒ mark of the rotary transformer board so that the screw hole on the upper drum and that on the lower drum are aligned. (Refer to Fig. 5.)
3) If attaching is difficult, attach a upper drum while rotating it slowly.

Note: Pay attention not to damage the video heads.
Confirm that the upper drum is inserted completely.

4) Tighten the two screws ③ (PSW3×8). (Refer to Fig. 5.)
5) Fix the earth shaft ② by tightening the screw ① (+P3×8) so that protrusion at the tip of the earth shaft contacts the center of the drum shaft.

Note: When attaching the ground shaft assembly ②, never give force to the plate spring ④.

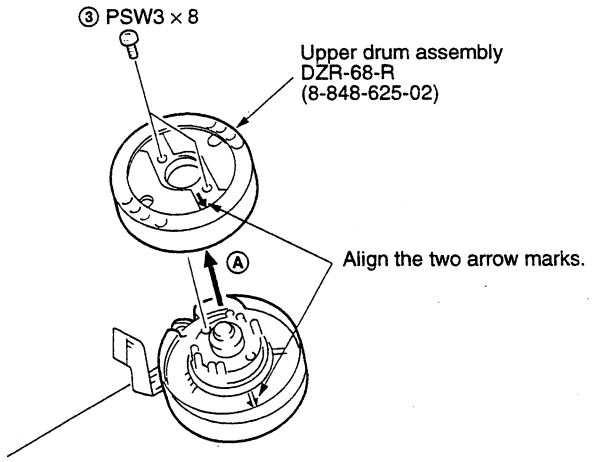


Fig. 5

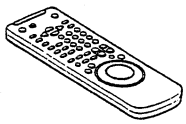
SECTION 1
GENERAL

This section is extracted from the SLV-X837AS instruction manual.

Step 1
Unpacking

Check that you have received the following items with the VCR:

- Remote commander



- Audio/video cable (3-phono to 3-phono)

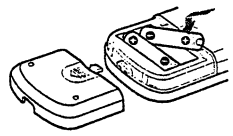
- R6 (size AA) batteries

- Aerial cable

Step 2
Setting up the remote commander

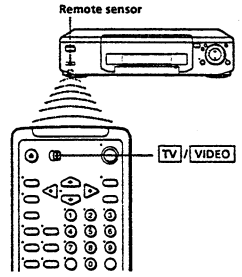
Inserting the batteries

Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.



Using the remote commander

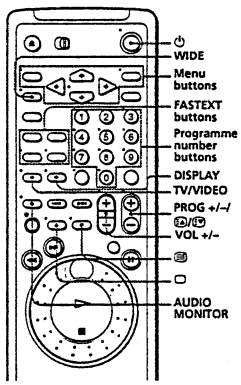
You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



To operate	Set TV/VIDEO to
the VCR	VIDEO and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

continued

Step 2 : Setting up the remote commander (continued)



TV control buttons

To	Press
Turn the TV into standby or active mode	⏻ (on/standby)
Select an input source of the TV either from aerial in or from line in	TV/VIDEO
Select the programme position of the TV	Programme number buttons PROG +/–
Adjust the volume of the TV	VOL +/–
Switch to TV (Teletext off)	▭ (TV)
Switch to Teletext	▤ (Teletext)
Select the sound	AUDIO MONITOR
Use FASTEXT	FASTEXT buttons
Call up on-screen display	DISPLAY
Change the Teletext page	⧉/⧉
Operate TV menu options	Menu buttons
Switch the wide mode of a Sony wide TV (For other manufacture's wide TV, see "Controlling other TVs with the remote commander" on page 7)	WIDE

Notes

- The TV/VIDEO button selects an input source of the TV from aerial in or line in. The button does not control this VCR.
- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not mix different types of batteries.

Controlling other TVs with the remote commander

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.

1 Set TV/VIDEO at the top of the remote commander to TV.

2 Hold down ⏻, and enter your TV's code number(s) using the number buttons. Then release ⏻.

Now you can use the ⏻, VOL +/–, PROG +/–, programme number buttons, –/-- (ten's digit) and TV/VIDEO buttons to control your TV. You can also use the buttons marked with a dot (•) to control a Sony TV. To control the VCR, reset TV/VIDEO to VIDEO.

Tip

- If you set your TV's code number correctly while the TV is turned on, the TV turns off automatically.

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony	01*1,02,03,04,05
Aiwa	32
Akai	68
Blaupunkt	10,21
Brionvega	40
C.G.M	09
Colonad	03
Dual	44

Manufacturer	Code number
Emerson	03,04
Fenner	30,31
Ferguson	52
Gold Star	03,04,17
Grundig	10*1,11*1
Hitachi	24
Hyper	31
Inno-Hit	41

continued

Step 2 : Setting up the remote commander (continued)

Manufacturer	Code number
Irradio	20
ITT/Nokia	15,16,69*3
JVC	33*3
Loewe	45
Mitsubishi	27*1,28*1,50*1,51*1
Mivar	09
NEC	66
Nordmende	35,42
Orion	47,48
Panasonic	17*1,49
Philips	06*1,07*1,08*1
Phonola	18,19
Pioneer	26
Saba	12,13

Manufacturer	Code number
Samsung	22,23
Sanyo	25
Schneider	46
Seleco	14
Sharp	29
Siemens	39
Sinudyne	37
TEAC	67
Telefunken	36
Thomson	43*2
Toshiba	38
White Westinghouse	34

You can use the WIDE button after entering a code number with any of the following marks;

*1: Press WIDE to switch the wide picture mode on or off.

*2: Press WIDE, then press VOL+/– to select the wide picture mode you want.

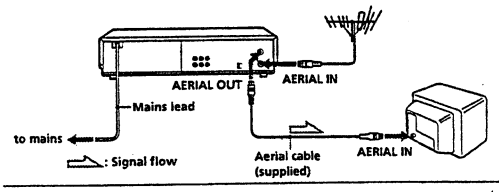
*3: Press WIDE. The menu appears on the TV screen. Then, press CURSOR ↑/↓/←/→ to select the wide picture you want and press EXECUTE.

Notes

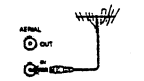
- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number automatically resets to 01 (Sony). Reset the appropriate code number.

Step 3

Connecting the VCR



1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.

3 Connect the mains lead to the mains.

continued

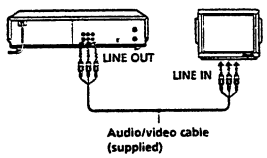
Step 3 : Connecting the VCR (continued)

Additional connections

To a TV that has audio/video input jacks

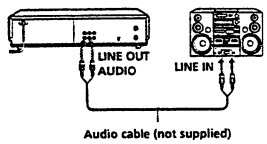
This additional connection improves picture and sound quality. Connect the TV as shown on the right.

If you want to use the Trinitron TV Synchro Play function (see page 31), this connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)



To a stereo system

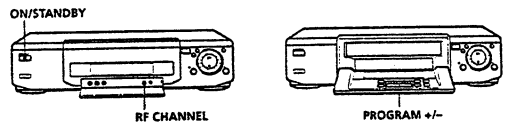
You can improve sound quality by connecting a stereo system as shown on the right.



Step 4

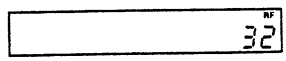
Tuning your TV to the VCR

If you have connected your VCR to the TV using the audio/video cable, skip this step.



1 ON/STANDBY Press ON/STANDBY to turn on the VCR.

2 RF CHANNEL Press RF CHANNEL on the VCR.
The factory-preset RF channel appears in the display window.
The VCR signal is output through this channel to the TV.



3 Turn on your TV and select a programme position for the VCR picture.
This channel will now be referred to as the video channel.

continued

Step 4 : Tuning your TV to the VCR (continued)

4 Tune the TV to the same channel as that shown in the display window so that the picture on the right appears on the TV screen.

Refer to your TV manual for tuning instructions.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" below.

5 RF CHANNEL — Press RF CHANNEL.

You have now tuned your TV to the VCR. From now on, whenever you want to play a tape, set the TV to the video channel.

To check to see if the TV tuning is correct

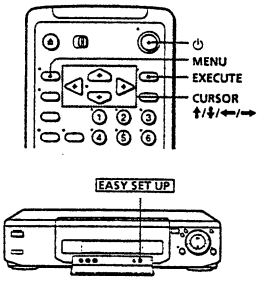
Set the TV to the video channel and press PROGRAM +/– on the VCR. If the TV screen changes to a different programme each time you press PROGRAM +/–, the TV tuning is correct

To obtain a clear picture from the VCR

If the picture does not appear clearly in step 4 above, press PROGRAM +/– in step 4, so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

Step 5

Setting up the VCR with EASY SET UP



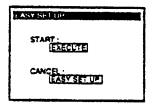
Before using the VCR for the first time, set up the VCR using the EASY SET UP function. With this function, you can set TV channels, guide channels for G-CODE, and the VCR clock, guided by the sequence indicated on the TV screen.

1 ⏻ — Press ⏻ to turn on the VCR.

2 Turn on your TV and set it to the video channel.

3 EASY SET UP — Press EASY SET UP on the VCR.

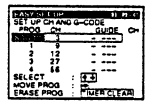
To cancel the EASY SET UP function, press EASY SET UP again.



4 EXECUTE — Press EXECUTE.

The VCR starts searching for all the receivable channels.

During presetting, the channel being located is displayed on the screen. When all the channels are preset, the following screen appears.



continued

Step 5 : Setting up the VCR with EASY SET UP (continued)

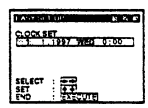
5 CURSOR — Using CURSOR ↑/↓/←/→, set the G-CODE guide channels, change the programme positions of the stations, and disable the unused programme positions. (If not necessary, skip this step.)

The setting procedures are the same as those described in "Manual setup — Setting up G-CODE" on page 20 and "Manual setup — Changing/disabling programme positions" on page 23.

6 EXECUTE — Press EXECUTE.

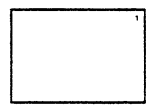
The CLOCK SET menu appears.

Set the date and time using CURSOR ↑/↓/←/→. The setting procedures are the same as those described in "Manual setup—Setting the clock" on page 26.



7 EXECUTE — Press EXECUTE .

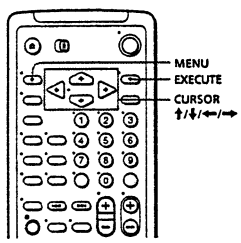
A programme position appears on the TV screen.



Note

- Do not exit EASY SET UP while the VCR is presetting channels. If you do, repeat EASY SET UP from the beginning.

Manual setup — Presetting channels



First, we recommend that you preset the receivable channels in your area using EASY SET UP or using automatic presetting below. Then, if some channels could not be preset automatically, you can preset them manually; if there are any unwanted channels among the preset ones, you can disable the channels.

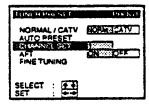
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

Presetting all receivable channels automatically

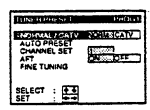
If you have preset the channels using the EASY SET UP procedure, skip this procedure.

1 MENU, CURSOR, EXECUTE — Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to TUNER PRESET and press EXECUTE.



2 CURSOR — Press CURSOR ↑/↓/←/→ to move the cursor (I) to NORMAL/CATV, then highlight NORM.

To preset CATV channels, highlight CATV.

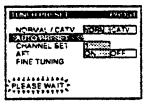


continued

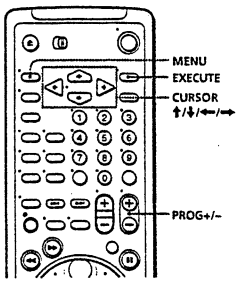
3 • CURSOR • EXECUTE

Press CURSOR ↑/↓ to move the cursor (I) to AUTO PRESET, then press EXECUTE.

All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.

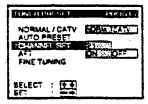


Presetting channels manually



1 • MENU • CURSOR • EXECUTE

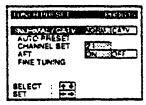
Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to TUNER PRESET and press EXECUTE.



2 • CURSOR

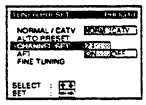
Press CURSOR ↑/↓/←/→ to move the cursor (I) to NORMAL/CATV, then select NORM.

To preset CATV channels, select CATV.



3 • CURSOR

Press CURSOR ↑/↓ to move the cursor (I) to CHANNEL SET.

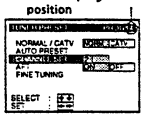


continued

4 • PROG

Press PROG +/– to select the programme position.

Selected programme position



5 • CURSOR

Press CURSOR ➡ repeatedly until the channel you want is displayed. Pressing CURSOR ⬅ goes back to the previous channels.

The channels are scanned in the following order:

Channel coverage	
VHF	AS0 to AS12, AS5A, AS9A
UHF	AS28 to AS69
CATV (TV distribution)	S1 to S41, S01 to S05

If you know the number of the channel you want, press the programme number buttons. For example, for channel 5, first press "0" and then press "5."

6

To allocate another channel to another programme position, repeat steps 4 and 5.

7 • EXECUTE

Press EXECUTE.

Disabling unwanted programme positions

After tuning the TV channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons. You can also disable unwanted programme positions using the SET UP CH AND G-CODE menu (page 25).

1 In step 5 above, press programme number button "0" twice to display the number "0" beside CHANNEL SET.

2 Press EXECUTE.

If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1 Press PROG +/– to select the programme number for which you cannot obtain a clear picture.

2 Press MENU, then select TUNER PRESET and press EXECUTE.

3 Select FINE TUNING. The fine tuning meter appears.

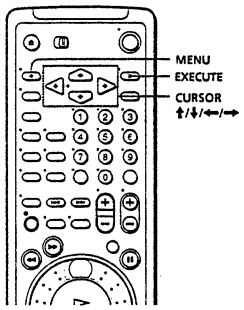
4 Press CURSOR ⬅/➡ to get a clearer picture, then press EXECUTE.

Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

Manual setup — Setting up G-CODE



G-CODE is a feature in Sony VCRs that simplifies programming the VCR to make timer recordings. To use G-CODE, each programme position needs to be matched with its G-CODE guide channel. To get the guide channel numbers, look in the programme guide for your area that features G-CODE numbers.

- If you want to record satellite broadcasts using G-CODE, see page 22.

Before you start...

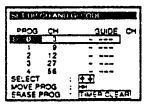
- Turn on the VCR and the TV.
- Set the TV to the video channel.

1 • MENU / • CURSOR / • EXECUTE

Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to SET UP CH AND G-CODE and press EXECUTE.

When using the EASY SET UP procedure, skip this step.

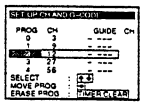
The preset channels are displayed on the screen.



2 • CURSOR

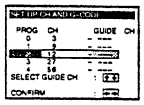
Press CURSOR ↑/↓ to move the cursor (I) to the row on which you want to set the guide channel.

To display other pages for programme positions 5 to 49, press CURSOR ↑/↓ repeatedly.



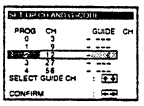
3 • CURSOR

Press CURSOR → twice to highlight the guide channel column.



4 • CURSOR

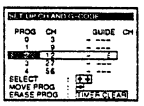
Press CURSOR ↑/↓ to select the guide channel number assigned in the programme guide.



5 • CURSOR

Press CURSOR ←/→ to confirm the setting.

The cursor (I) appears in the leftmost column.



6

To set the guide channel of another station, repeat steps 2 to 5.

If you want to change the programme positions of the stations, proceed to step 2 of "Manual setup — Changing/disabling programme positions" on page 23.

7 • EXECUTE

Press EXECUTE.

continued

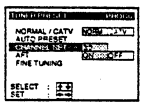
Setting up G-CODE for satellite broadcasts

When your satellite tuner is connected via the AERIAL IN connector, first you have to set the programme position for each satellite channel using the TUNER PRESET menu. Then set the guide channel number for each satellite channel using the SET UP CH AND G-CODE menu.

If your satellite tuner is connected via the LINE-1 IN jacks, you don't have to set programme positions nor guide channel numbers for satellite channels. Skip the following operations.

1. Turn on the satellite tuner.
2. Press MENU, then select TUNER PRESET and press EXECUTE.
3. Press PROG +/– to select a programme position you want to use for watching a satellite channel.
4. Select CHANNEL SET, then press CURSOR → to tune the VCR to the satellite tuner.

   The channel number displayed beside CHANNEL SET is used for receiving all satellite broadcasts from the satellite tuner.



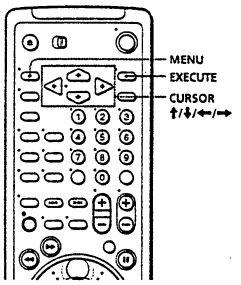
5. Press PROG +/– to select another programme position for another satellite channel, and press the programme number buttons to enter the same channel number as the one displayed in step 4.

   Repeat this step for all satellite channels.
6. Set the guide channel number for each programme position assigned to the satellite channel, following the procedures in "Manual setup — Setting up G-CODE" on page 20.

Notes

- The menu disappears automatically if you don't proceed for more than a few minutes.
- If you inadvertently entered a guide channel number, press CURSOR ↑/↓ repeatedly to reset the "GUIDE CH" column to "—." "—" appears between 1 and 255.
- The VCR does not allow entering the guide channel number, if the same number has been set.
- If you use a satellite tuner connected via the LINE-1 IN jacks, you don't have to setup G-CODE. Just record a satellite programme using G-CODE, and the VCR automatically records the programme from the LINE-1 IN jacks.
- When you record a satellite broadcast using G-CODE, you need to select the desired channel on the satellite tuner manually.

Manual setup — Changing/ disabling programme positions



After setting the channels and G-CODE guide channels, you can change the programme positions as you like. If any programme positions are unused or contain unwanted channels, you can disable them.

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

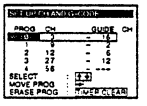
Changing programme positions

e.g. Moving the programme position from 3 to 1

1 • MENU / • CURSOR / • EXECUTE

Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to SET UP CH AND G-CODE and press EXECUTE.

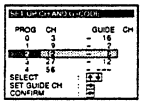
When using the EASY SET UP procedure, skip this step.



2 • CURSOR

Press CURSOR ↑/↓ to move the cursor (I) to the row on which you want to change the programme position, then press CURSOR →.

To display other pages for programme positions 5 to 49, press CURSOR ↑/↓ repeatedly.



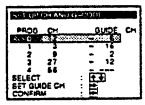
continued

Manual setup — Changing/disabling programme positions (continued)

3 • CURSOR

Press CURSOR ↑/↓ until the selected channel and guide channel row moves to the desired programme position.

The selected channel and guide channel are inserted at the new programme position and the intermediate channels are displaced to fill the gap.



4 • CURSOR

Press CURSOR ← to confirm the setting.

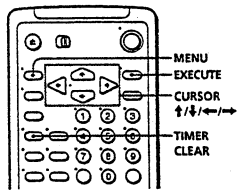
5

To change the programme position of another station, repeat steps 2 to 4.

6 • EXECUTE

Press EXECUTE.

Disabling unwanted programme positions



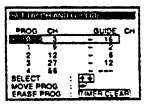
Note

- Be sure to select the programme position you want to disable correctly. If you disable a programme position by mistake, you need to reset that channel manually.

1 • MENU • CURSOR • EXECUTE

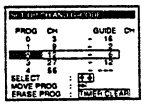
Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to SET UP CH AND G-CODE and press EXECUTE.

When using the EASY SET UP procedure, skip this step.



2 • CURSOR

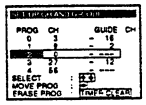
Press CURSOR ↑/↓ to move the cursor (I) to the row on which you want to disable.



3 TIMER • CLEAR

Press TIMER CLEAR.

The selected row will be cleared as shown on the right.



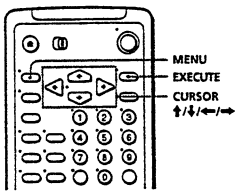
4

Repeat steps 2 and 3 for any other programme positions you want to disable.

5 • EXECUTE

Press EXECUTE.

Manual setup — Setting the clock



You must set the time and date on the VCR to be able to use the timer recording features properly. If you have not set the VCR clock in the EASY SET UP procedure, you need to set it manually.

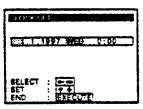
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

1 • MENU • CURSOR • EXECUTE

Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to CLOCK SET and press EXECUTE.

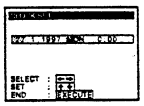
When using the EASY SET UP procedure, skip this step.



2 • CURSOR

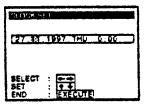
Press CURSOR ↑/↓ to set the date.

The day of the week is set automatically.



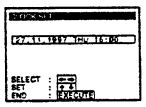
3 • CURSOR

Press CURSOR → to highlight the month and set the month using CURSOR ↑/↓.



4 • CURSOR

Set the year, hour and minutes in sequence, using CURSOR → to highlight the item to be set, and CURSOR ↑/↓ to select the digits.



5 • EXECUTE

Press EXECUTE to start the clock.

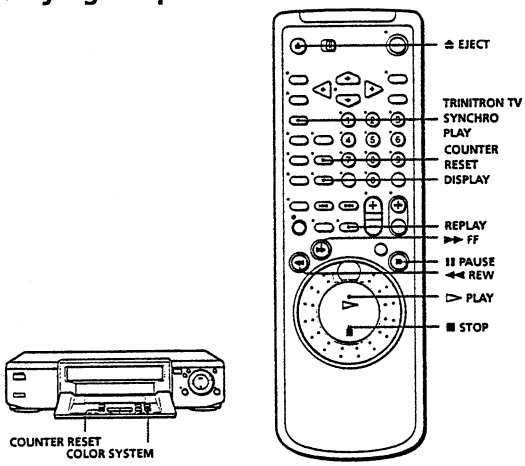
Tip

- To change the digits during setting, press CURSOR ← to return to the item to be changed, and select the digits using CURSOR ↑/↓.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

Playing a tape



1 Turn on your TV and set it to the video channel.

2 Open the drop down panel and insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.

3 PLAY ▷ Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Search forward	▶▶ FF during playback
Search backward	◀◀ REW during playback
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	⏏ EJECT

Replaying a recently watched scene

You can immediately rewind and playback the scene you want to watch again.

During playback, press REPLAY up to four times. The VCR rewinds the tape 10 seconds for each press of the button, and restarts playback.

To set the colour system

If streaks appear during playback, press COLOR SYSTEM on the VCR to conform to the system that the tape was recorded in. (Normally, the colour system is correctly set whenever the tape is inserted.)

If your tape was recorded in	Press COLOR SYSTEM until the indication below appears in the display window
PAL	PAL
NTSC	NTSC
MESECAM	PAL

To play an NTSC-recorded tape

Set NTSC PB at the rear of the VCR according to the color system of your TV.

If your TV is	Set NTSC PB to
PAL	ON PAL TV
NTSC 4.43	NTSC 4.43
NTSC 3.58	NTSC 3.58

continued

Playing a tape (continued)

To use the time counter

At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0H00M00S." Search for the point afterwards by referring to the counter.

To display the counter on the TV screen, press DISPLAY.

Notes

- The counter resets to "0H00M00S" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two video systems.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - the picture is black and white
  - the picture shakes
  - no picture appears on the TV screen
  - black streaks appear horizontally on the TV screen
  - the colour density increases or decreases.

Turning on the VCR and TV, and starting playback automatically (Trinitron TV Synchro Play)

You can only use this function if your TV is made by Sony (Trinitron TV).

How to connect to use this function

Connect the VCR and TV with the audio/video cable (see "To a TV that has phono type audio/video input jacks" on page 10.) Be sure to connect the audio/video cable to the VIDEO IN 1 jacks on the TV if the TV has two inputs or more. The TV must be placed where it will respond to the remote commander while you are pointing it at the VCR.

Operation

Make sure that the TV's power is in standby mode.

Press TRINITRON TV SYNCHRO PLAY and hold the remote commander in place for about two seconds.

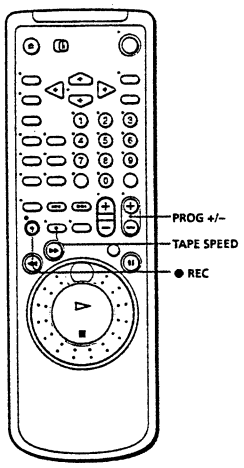
The VCR and TV turn on, and the TV is set to VCR reception. If there is a tape in the VCR, playback starts automatically.

Notes

- If the Trinitron TV Synchro Play function does not work properly:
  - Wait a few moments, and press the button again.
  - Replace both of the batteries with new ones, and press the button again.

  Note that this function may not operate some Sony TVs because of the remote commander's signal limitations.
- Do not press TRINITRON TV SYNCHRO PLAY while playing back a video tape. If you do so, the TV's input source will momentarily switch to the TV's tuner.

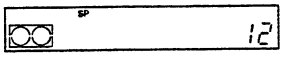
Recording TV programmes



1 Turn on your TV and set it to the video channel.

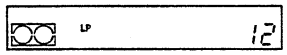
2 Open the drop down panel and insert a tape with its safety tab in place.

3 • PROG Press PROG +/– to select the programme position you want to record.



4 TAPE • SPEED Press TAPE SPEED to select the tape speed, SP or LP.

LP provides recording time twice as long as SP, however, SP produces better picture and audio quality.



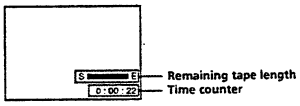
5 ● REC Press ● REC to start recording.

To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.



To watch another TV programme while recording

1 If the TV is connected to the VCR using an audio/video cable, set the TV to TV input. If the TV is connected to the VCR using only the aerial cable, skip this step.

2 Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.

continued

Recording TV programmes (continued)

To record NTSC colour system programmes

NTSC colour signals can be recorded on this VCR.

For tape speed, select SP or EP in step 4.
EP provides recording time three times as long as SP, however, SP produces better picture quality.

When playing back, the VCR automatically detects the tape speed.

Tips

- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the –/-- (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 IN or the LINE-2 IN jacks using INPUT SELECT.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV.

Notes

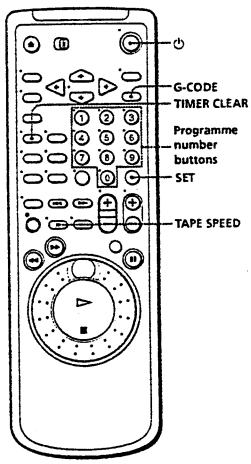
- The display does not appear during still (pause) mode or slow-motion playback.
- The display will not appear while playing an NTSC-recorded tape.

Recording TV programmes using G-CODE

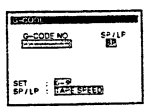
Just enter the programme's G-CODE number listed in the TV programme guide. The date, times and programme position of that programme are set automatically. You can preset up to eight programmes at a time.

Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.

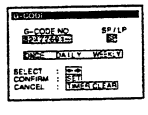


1 G-CODE Press G-CODE.



2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪ Press the programme number buttons to enter the programme's G-CODE number.

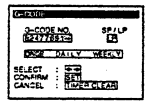
If you make a mistake, press TIMER CLEAR and re-enter the correct number.



continued

3 TAPE SPEED

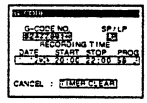
Press TAPE SPEED to select SP or LP.



4 CURSOR, SET

Select ONCE, DAILY or WEEKLY by using CURSOR ←/→, then press SET.

To record	Select
Only once	ONCE
Everyday Monday to Friday	DAILY
Once a week	WEEKLY



The date, start and stop times, programme position, and tape speed appear on the TV screen.

If the information is not correct, press TIMER CLEAR to cancel the setting.

5 To enter another setting, repeat steps 1 to 4.

6 ⏻

Press ⏻ to turn off the VCR.

The TIMER indicator appears in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, press ■ STOP.

To record satellite broadcasts

If you connect the satellite tuner and the VCR, you can record satellite programmes.

1 Turn on the satellite tuner.
2 On the satellite tuner, select the satellite programme for which you wish to make a timer setting.
3 Repeat the steps described above.
4 Keep the satellite tuner turned on until the VCR finishes recording the satellite programme for which you have made a timer setting.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press ⏻. The TIMER indicator turns off and the VCR switches on. Remember to press ⏻ to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

Tip

- To cancel the procedure, press G-CODE before pressing SET.

Note

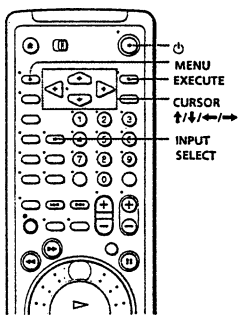
- If the VCR beeps repeatedly, this means that:
  - The G-CODE number is incorrect.
  - ONCE, DAILY, or WEEKLY was selected incorrectly. You cannot select DAILY or WEEKLY for a programme that airs more than seven days ahead.

Setting the timer manually

If G-CODE is not available in your area, follow the instructions below to set the timer to record programmes.

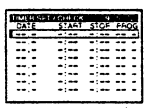
Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1 MENU, CURSOR, EXECUTE

Press MENU and select TIMER SET/CHECK, then press EXECUTE.

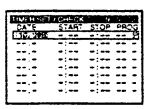


2 CURSOR

Set the date, start and stop times, programme position, and tape speed:

1 Press CURSOR → to highlight each item in turn.
2 Press CURSOR ↑/↓ to set each item.

To correct a setting, press CURSOR ← to return to that setting and reset.



To record the same programme every day or the same day every week, press CURSOR ↓ while the date is highlighted. For details, see "Daily/weekly recording" on the next page.

To record from a source connected to the LINE-1 IN or the LINE-2 IN jacks, press INPUT SELECT to display "LINE1" or "LINE2" in the "PROG" position.

3 CURSOR

Press CURSOR → to confirm the setting.

The cursor (I) appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4 EXECUTE

Press EXECUTE.

5 ⏻

Press ⏻ to turn off the VCR.

The TIMER indicator appears in the display window and the VCR stands by for recording.

To record from other equipment, leave the connected equipment switched on.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

In step 2 above, press CURSOR ↓ to select the recording pattern. Each time you press CURSOR ↓, the indication changes as shown below. Press CURSOR ↑ to change the indication in reverse order.

the current date → SUN-SAT → MON-SAT → MON-FRI → EVERY SAT ..... → EVERY MON → EVERY SUN → 1 month later →(dates count down) → the current date

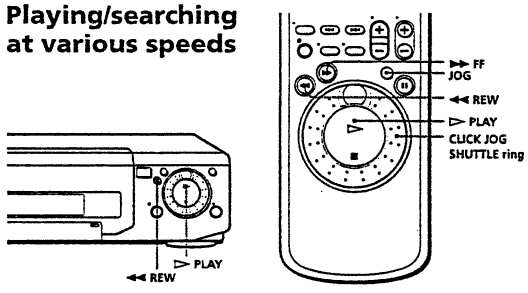
Tips

- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use TAPE SPEED.
- To record NTSC signals, set the tape speed to SP or EP. To set the EP mode, display "LP" in the tape speed position.

Note

- "TIMER" flashes in the display window when you press ⏻ with no tape inserted.

Playing/searching at various speeds



Playback options	Operation
Fast-forward/rewind	During stop, press ▶▶ FF or ◀◀ REW.
View the picture during fast-forward or rewind	During fast-forward, hold ▶▶ FF down. During rewind, hold ◀◀ REW down.
Rewind and start play	During stop, hold ◀◀ REW on the VCR, and press ▷ PLAY on the VCR.

To resume normal playback

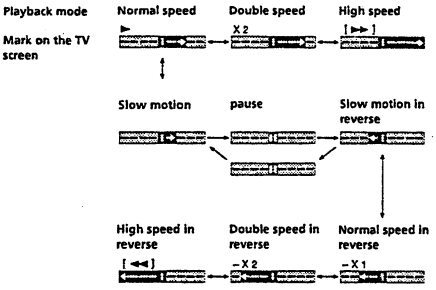
Press ▷ PLAY.

Using the CLICK JOG SHUTTLE ring

With the CLICK JOG SHUTTLE ring you can operate a variety of playback options.
There are two ways to use the CLICK JOG SHUTTLE ring: normal mode (CLICK SHUTTLE ring) and jog mode (CLICK JOG ring).

To use the CLICK SHUTTLE ring in normal mode

During playback or pause, turn the CLICK SHUTTLE ring clockwise or counterclockwise. Each change in the CLICK SHUTTLE ring position changes the playback mode, and the corresponding mark appears on the TV screen for a few seconds in the following way if the on-screen display function is on.



To use the CLICK JOG ring in jog mode

Use this mode for frame-by-frame playback.
Press JOG to enter the jog mode. The JOG button/indicator lights up. If you change to jog mode during any playback mode, playback pauses so you can see a still picture. Each change in the CLICK JOG ring position shifts the picture one frame. To shift frames in reverse, turn the CLICK JOG ring counterclockwise.
The frame shift speed depends on the speed you turn the CLICK JOG ring.
To resume normal playback, press ▷ PLAY.

Tip

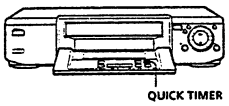
- Adjust the picture using TRACKING +/– if:
  - streaks appear while playing in slow motion.
  - bands appear at the top or bottom while pausing.
  - the picture shakes while pausing.

Notes

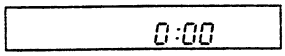
- The playback sound is muted during these operations.
- In the LP mode, noise may appear or there may be no colour.
- If the playback mode mark doesn't appear on the TV screen, press DISPLAY.

Recording TV programmes using the quick timer

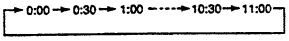
After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



1 While recording, press QUICK TIMER on the VCR once.



2 Press QUICK TIMER repeatedly to set the duration.
Each press advances the time in increments of 30 minutes.



The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

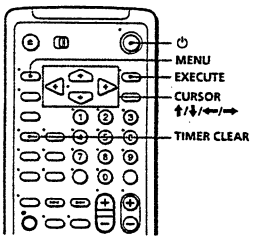
To stop recording

To stop the VCR while recording, press ■ STOP.

Tip

- You can also set the quick timer and start recording during the stop mode.

Checking/ changing/ cancelling timer settings



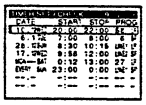
Before you start...

- Turn on your TV and set it to the video channel.

1 Press ⏻ to turn on the VCR.

2 Press MENU, then select TIMER SET/CHECK:

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press EXECUTE, then turn off the VCR to return to recording standby.



3 Press CURSOR ↑/↓ to select the setting you want to change or cancel:

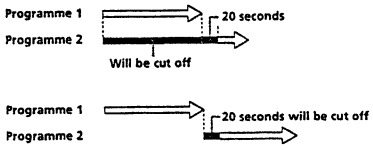
- To change the setting, press CURSOR ←/→ to highlight the item you want to change, and press CURSOR ↑/↓ to reset it. Then, press CURSOR → repeatedly until the cursor (I) appears at the beginning of the line.
- To cancel the setting, press TIMER CLEAR.

4 Press EXECUTE.
If any settings remain, turn off the VCR to return to recording standby.

continued

When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Recording stereo and bilingual programmes

This VCR automatically receives and records stereo and bilingual programmes. When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To select bilingual sound while recording

Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO

To select the sound during playback

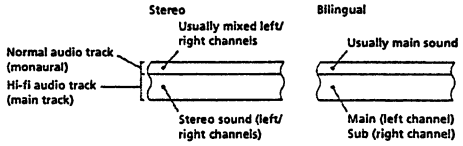
Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	STEREO
Left channel/main	LCH	STEREO
Right channel/sub	RCH	STEREO
Standard sound	No indicator	No indicator

continued

How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.

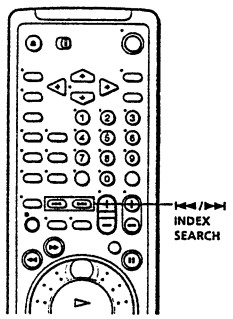


Notes

- To play a tape in stereo, you must use the AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the SET UP MENU is set to OFF.
- If HIFI AUDIO is set to STD, the standard sound will be recorded on both the hi-fi and normal audio tracks. Pressing AUDIO MONITOR will not change the sound.

Searching using the index function

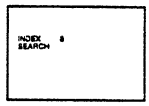
The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position.



1 Insert an indexed tape into the VCR.

2 Press ⏮/⏭ INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:

- To search ahead, press ⏭ INDEX SEARCH.
- To search backwards, press ⏮ INDEX SEARCH.



The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts automatically from that point.

To stop searching

Press ■ STOP.

Note

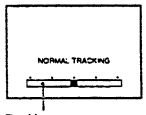
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the tracking indicator ▩ flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

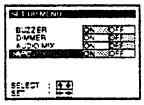
Press the TRACKING +/– buttons to display the tracking meter. The distortion should disappear as you press one of the two buttons (The ▩ indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



Tracking meter

About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the SET UP MENU (with the APC indicator in the display window lit).



APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the APC

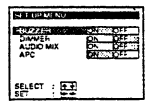
Press MENU and select SET UP MENU, then set APC to OFF. The APC indicator in the display window goes off.

Note

- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyse the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately. If you want to start recording quickly without using the APC function, first set the VCR to recording pause (the APC indicator flashes slowly) and press ❚❚ PAUSE to start recording.

Changing menu options

1 Press MENU, then select SET UP MENU.



2 Press CURSOR ↑/↓ to select the option to change, then press CURSOR ←/→ to change the setting.

3 Press EXECUTE to return to the original screen.

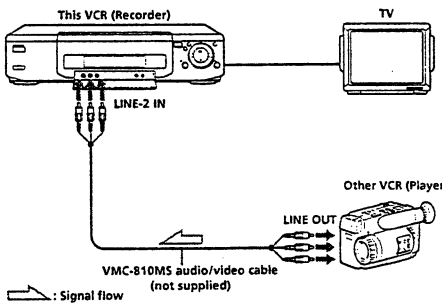
Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
BUZZER	**ON** to output a beep sound when all illogical operation is made. **OFF** to deactivate it.
DIMMER	**ON** to make the display window dim, **OFF** to make it brighter.
AUDIO MIX	**ON** to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. **OFF** to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button.
APC	**ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality. OFF to switch off APC.

Connecting to a VCR or stereo system

How to connect to record on this VCR



Tips

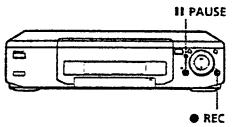
- Make sure you connect the plugs to jacks of the same colour.
- If the other VCR is a monaural type, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- You can also use the LINE-1 IN jacks instead.

How to connect to a stereo system

Connect LINE-2 IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

Basic editing

(when recording on this VCR)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" in the display window.
- Press TAPE SPEED to select the tape speed (SP or LP for the PAL system, and SP or EP for the NTSC system).

1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press ❚❚ PAUSE.

3 Press ● REC on this VCR and set it to recording pause.

4 To start editing, press the ❚❚ PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tips

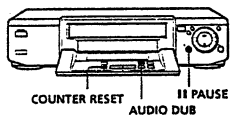
- To edit more precisely, press the ❚❚ PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press ❚❚ PAUSE on this VCR when an unwanted scene begins. When it ends, press ❚❚ PAUSE again to resume recording.

Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyses the tape. Then when you start recording in step 4, press ❚❚ PAUSE after the APC indicator stops flashing. If you press ❚❚ PAUSE before the APC indicator stops flashing, the APC function is cancelled.

Audio dubbing

This feature lets you record over the normal audio track. The monaural sound previously recorded is replaced while the original hi-fi sound remains unchanged. Use this feature to add commentary to a tape that you have recorded with a camcorder.



Before you start dubbing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" in the display window.

1 Insert a source tape into the stereo system (or the playback VCR). Search for the point to start playback and set it to playback pause.

2 Open the drop down panel and insert a prerecorded tape into this (recording) VCR. Search for the end of the section to be replaced and press II PAUSE.

Make sure that the tape has its safety tab in place.

3 Press COUNTER RESET on this VCR to reset the counter to "0H00M00S."

4 Rewind the prerecorded tape to the beginning of the section to be replaced.

The VCR pauses.

5 Press AUDIO DUB.

The audio dubbing indicator ⊖ appears in the display window.

6 To start editing, press the II PAUSE buttons on this VCR and the stereo system (or other VCR) at the same time.

When the counter reaches "0H00M00S," audio dubbing stops automatically.

To stop while editing

Press the ■ STOP buttons on this VCR and the stereo system (or other VCR).

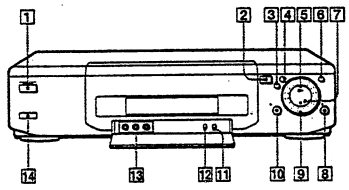
To listen to both the hi-fi and normal audio

Set AUDIO MIX to ON in the SET UP MENU (page 49). Use this feature to listen to dubbed audio over the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function. Remember to reset AUDIO MIX to OFF after playing the tape.

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

Front panel

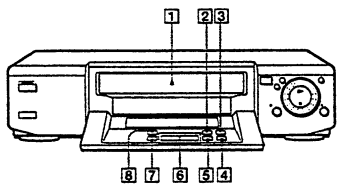


1 ON/STANDBY switch/indicator (11)
2 ⏏ EJECT button (29)
3 ◄◄ REW button (29, 40)
4 ►► FF button (29, 40)
5 ▷ PLAY button (28)
6 JOG button/indicator (41)
7 ■ STOP button (29, 33)
8 ● REC button (33)
9 CLICK JOG SHUTTLE ring (40)
10 II PAUSE button (29, 51)
11 EASY SET UP button (13)
12 RF CHANNEL button (11)
13 LINE-2 IN AUDIO L/R/VIDEO jacks (50)
14 Remote sensor (5)

continued

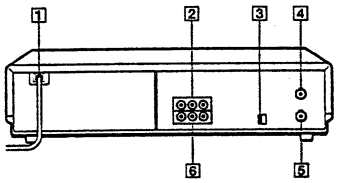
Index to parts and controls (continued)

Front panel, with cover opened



1 Tape compartment
2 AUDIO DUB button (52)
3 QUICK TIMER button (42)
4 COLOR SYSTEM button (29)
5 TAPE SPEED button (33)
6 PROGRAM/TRACKING +/− buttons (12, 48)
7 COUNTER RESET button (30)
8 INPUT SELECT button (34, 38)

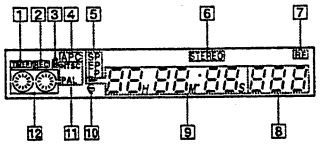
Rear panel



1 Mains lead (9)
2 LINE-1 IN AUDIO L/R/VIDEO jacks (50)
3 NTSC PB switch (29)
4 AERIAL OUT connector (9)
5 AERIAL IN connector (9)
6 LINE OUT AUDIO L/R/VIDEO jacks (10)

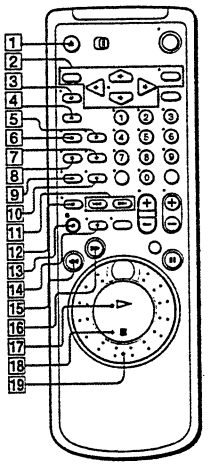
continued

Display window



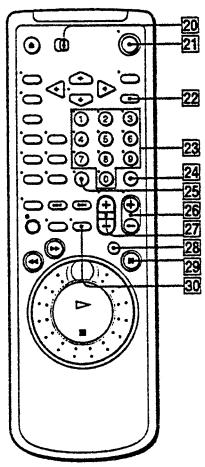
1 TIMER indicator (36, 39)
2 REC indicator
3 (Tracking) indicator (48)
4 APC indicator (48)
5 Tape speed indicator (33)
6 STEREO indicator (45)
7 RF indicator (11)
8 Line/programme position indicator (11, 32)
9 Time counter/clock (30)
10 ⊖ (Audio dub) indicator (52)
11 Colour system indicator (29)
12 Tape indicator

Remote commander



1 ⏏ EJECT button (29)
2 Menu buttons (13)
MENU button
CURSOR ↑/↓/←/→ buttons
EXECUTE button
3 WIDE button (*for TV*) (6)
4 TRINITRON TV SYNCHRO PLAY button (31)
5 INPUT SELECT button (34, 38)
6 TIMER CLEAR button (25, 36, 43)
7 COUNTER RESET button (30)
8 AUDIO DUB button (52)
9 TV/VIDEO button (*for TV*) (6)
10 DISPLAY button (30)
11 ⏮/⏭ INDEX SEARCH buttons (47)
12 AUDIO MONITOR button (45, 52)
13 ● REC button (33)
14 TAPE SPEED button (33)
15 ◀◀ REW button (29, 40)
16 ▶▶ FF button (29, 40)
17 ▷ PLAY button (28)
18 ■ STOP button (29)
19 CLICK JOG SHUTTLE ring (40)

continued

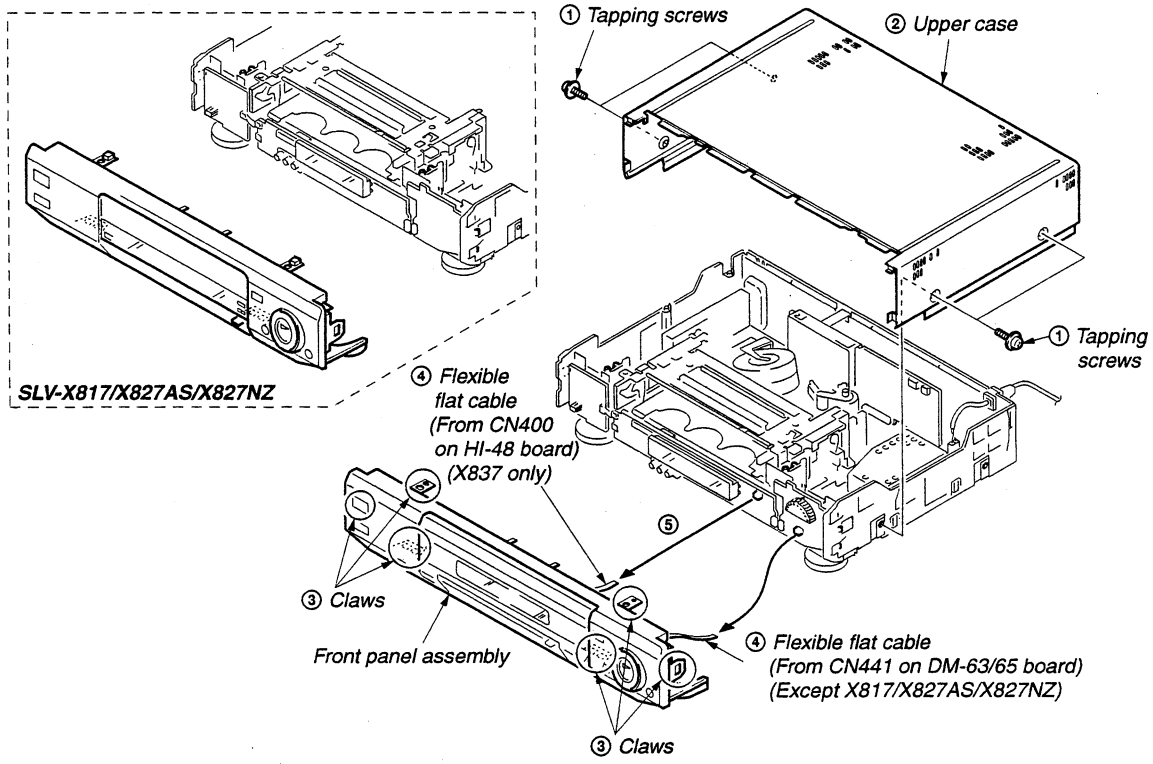


20 TV/VIDEO remote control switch (5)
21 ⏻ (on/standby) switch
22 G-CODE button (35)
23 Programme number buttons (35)
24 SET button (36)
25 –/-- (ten's digit) button (34)
26 PROG +/– buttons (18, 32)
27 VOL +/– buttons (*for TV*)
28 JOG button/indicator (40)
29 ⏸ PAUSE button (29)
30 REPLAY button (29)

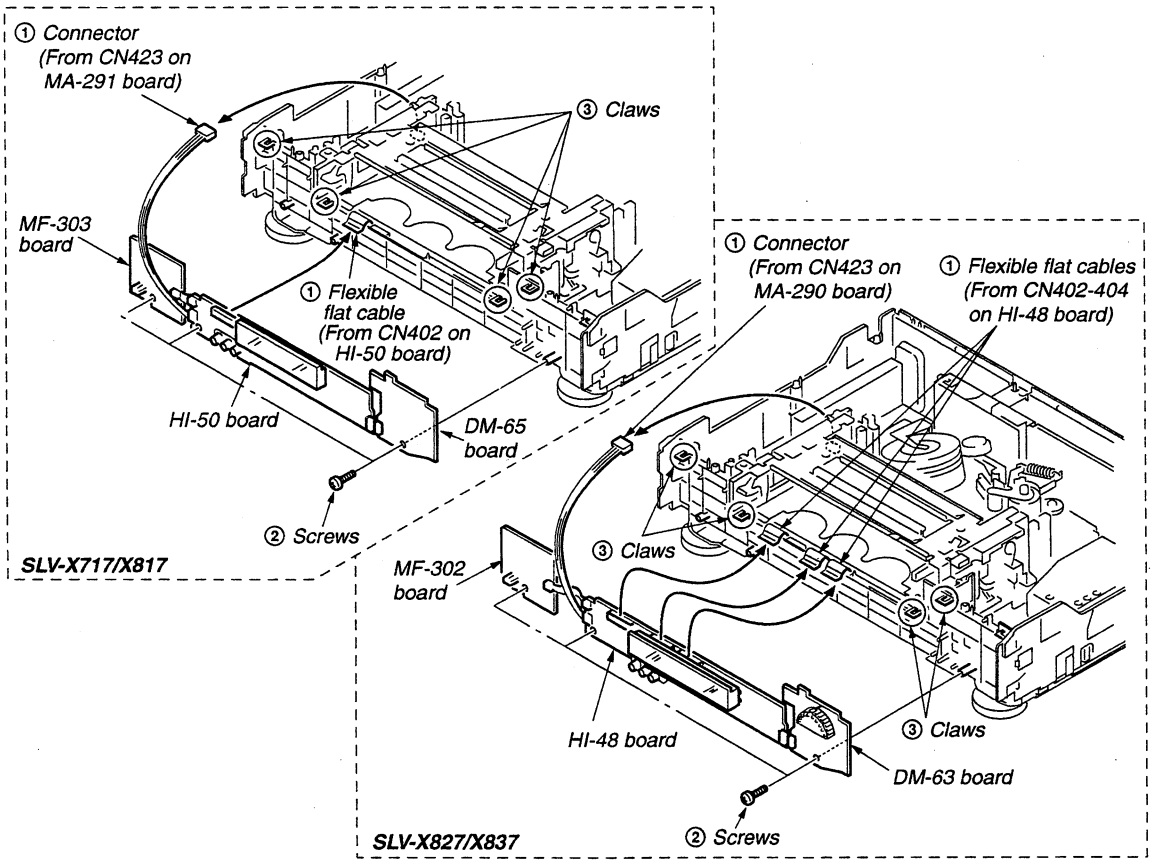
SECTION 2
DISASSEMBLY

NOTE : Follow the disassembly procedure in the numerical order given.

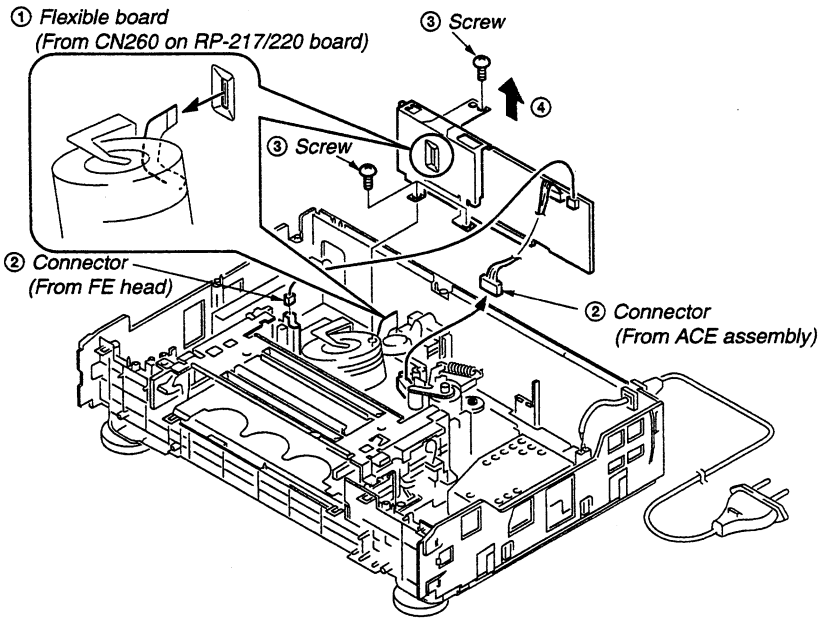
2-1. FRONT PANEL ASSEMBLY


① Tapping screws
② Upper case
① Tapping screws
SLV-X817/X827AS/X827NZ
④ Flexible flat cable (From CN400 on HI-48 board) (X837 only)
⑤
③ Claws
Front panel assembly
④ Flexible flat cable (From CN441 on DM-63/65 board) (Except X817/X827AS/X827NZ)
③ Claws

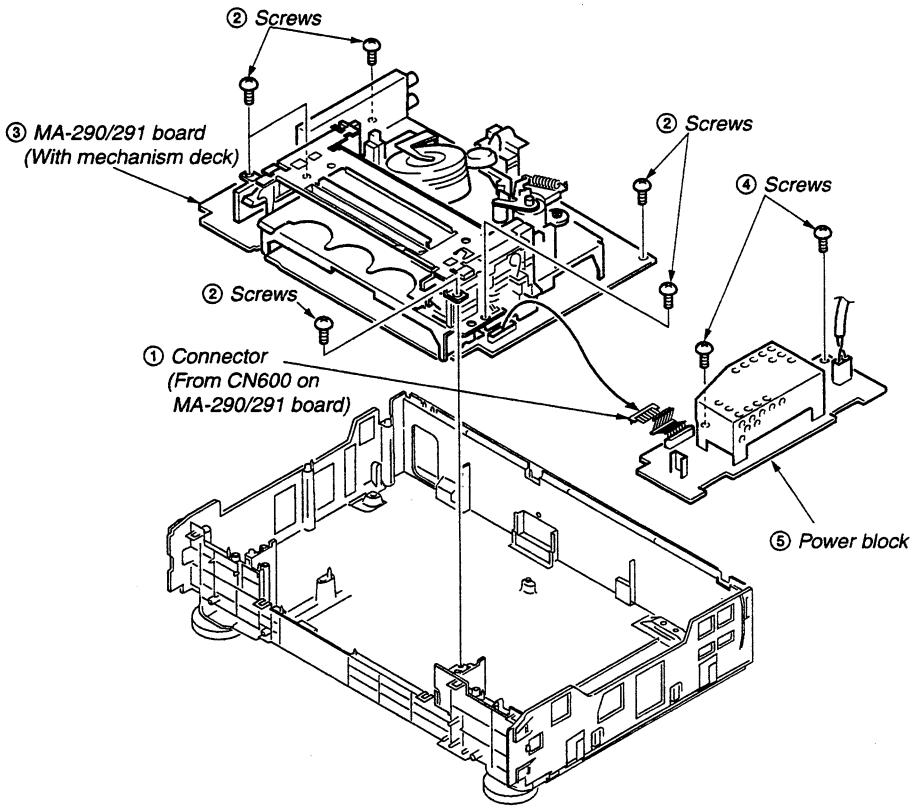
2-2. MF-302/303, HI-48/50, DM-63/65 BOARDS



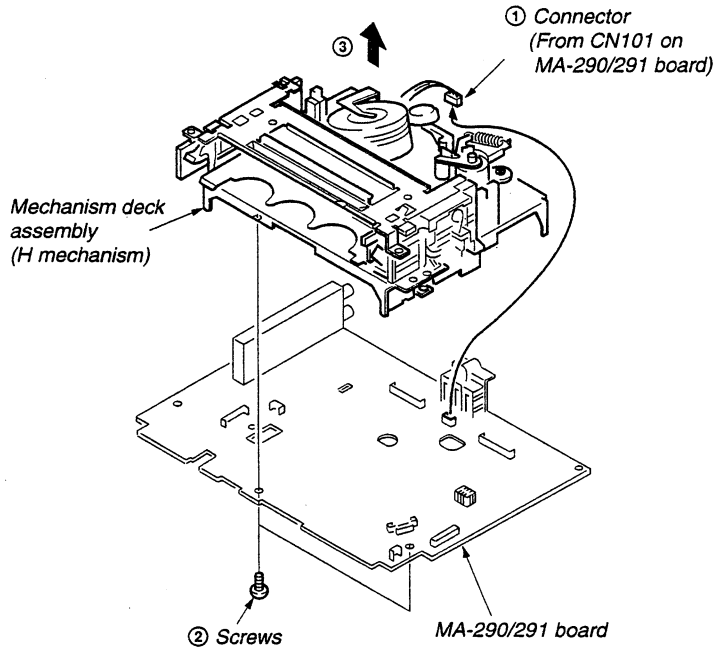
2-3. RP-218/220 BOARD



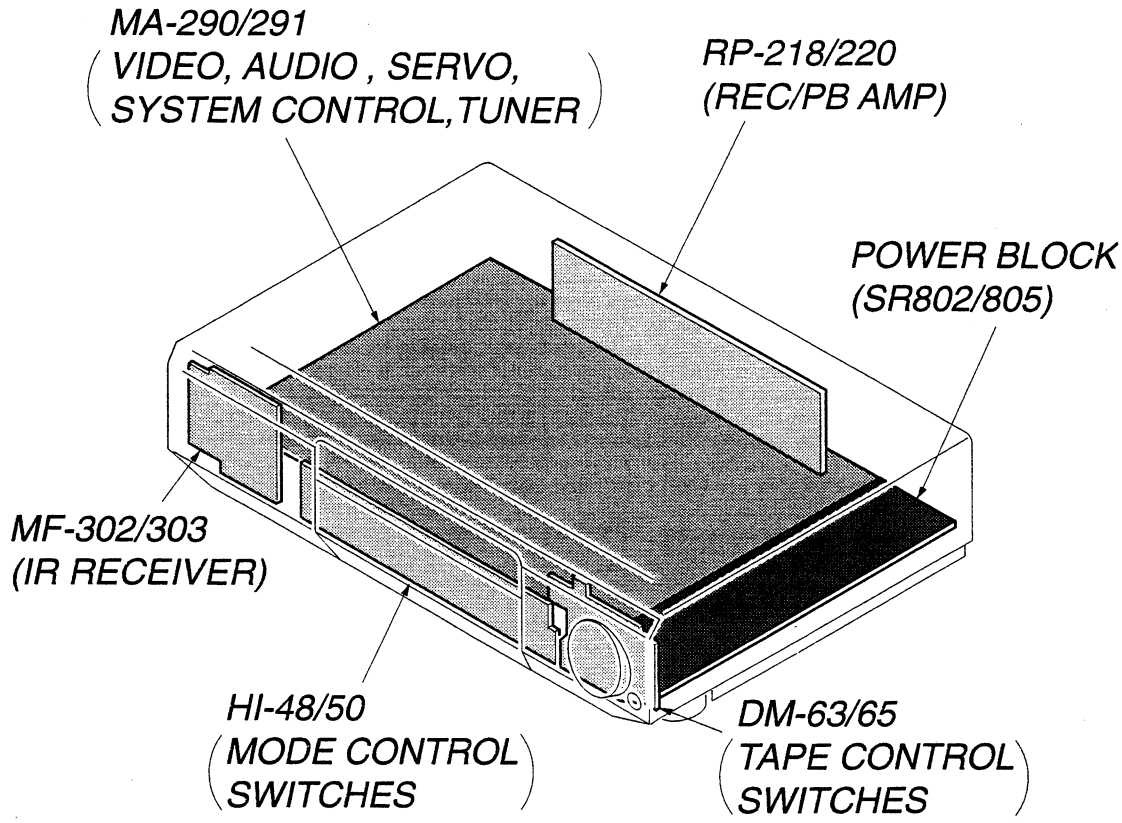
2-4. MA-290/291 BOARD (WITH MECHANISM DECK), POWER BLOCK



2-5. MECHANISM DECK ASSEMBLY (H MECHANISM)

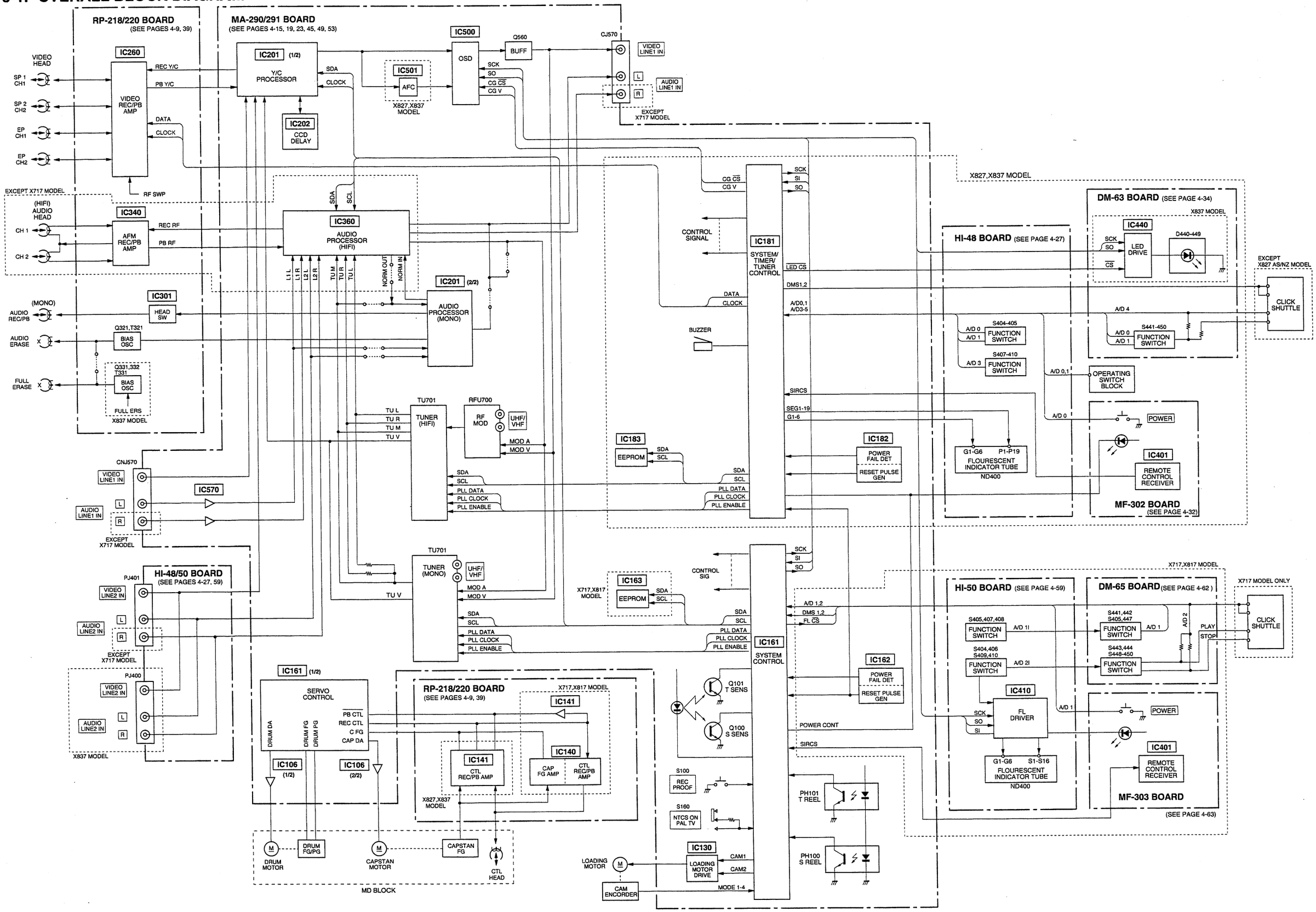


2-6. CIRCUIT BOARDS LOCATION

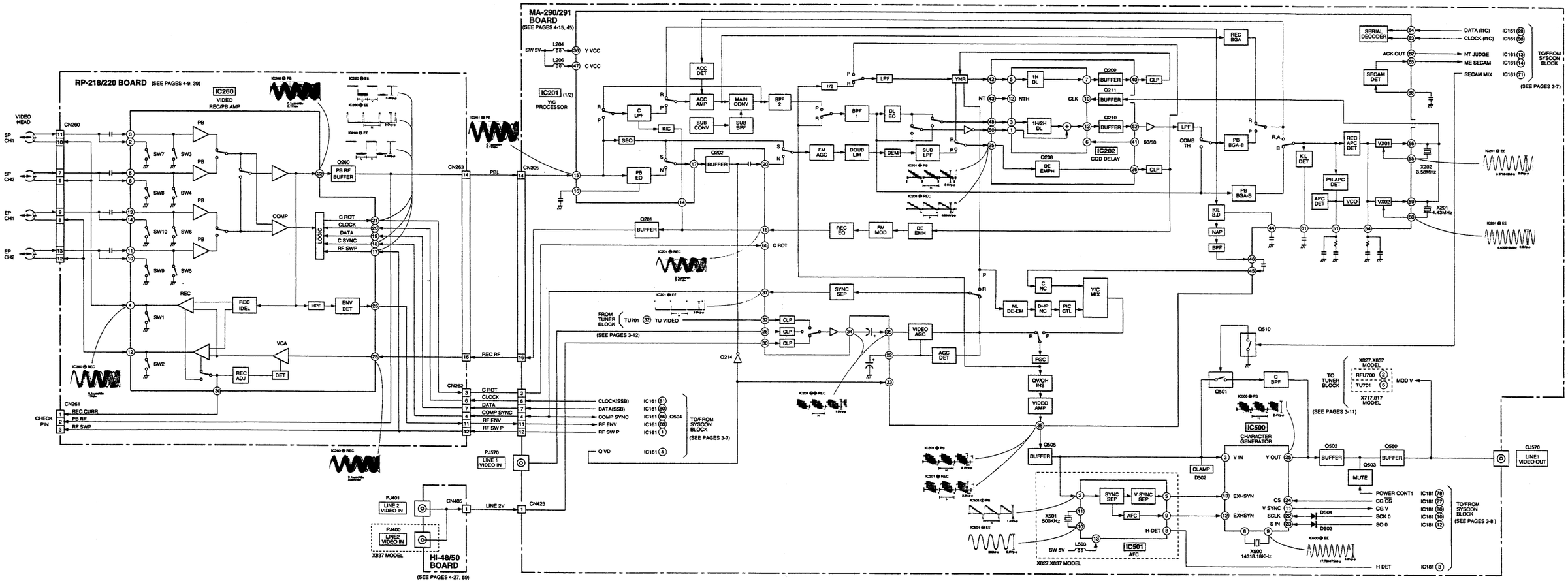


SECTION 3
BLOCK DIAGRAMS

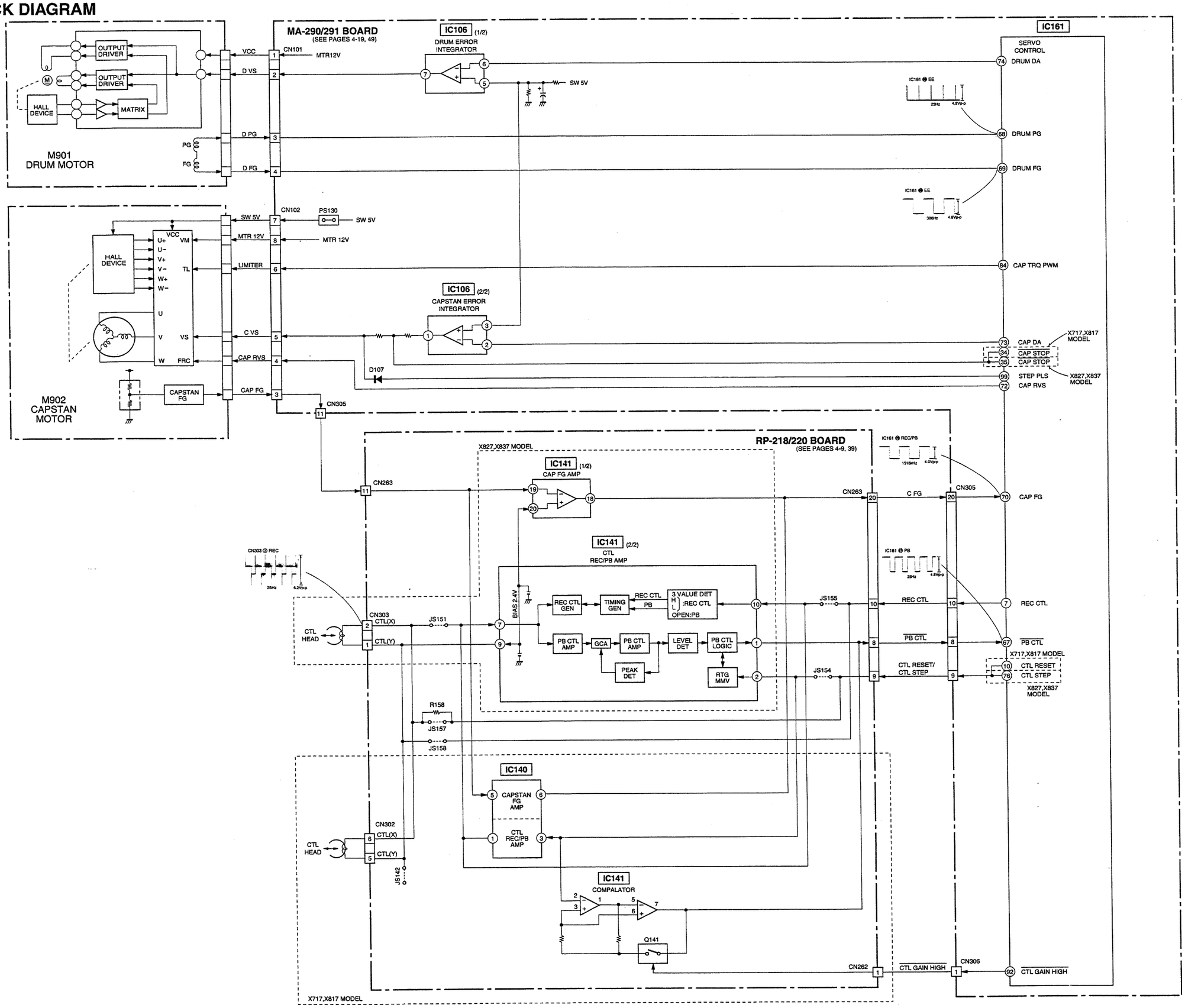
3-1. OVERALL BLOCK DIAGRAM



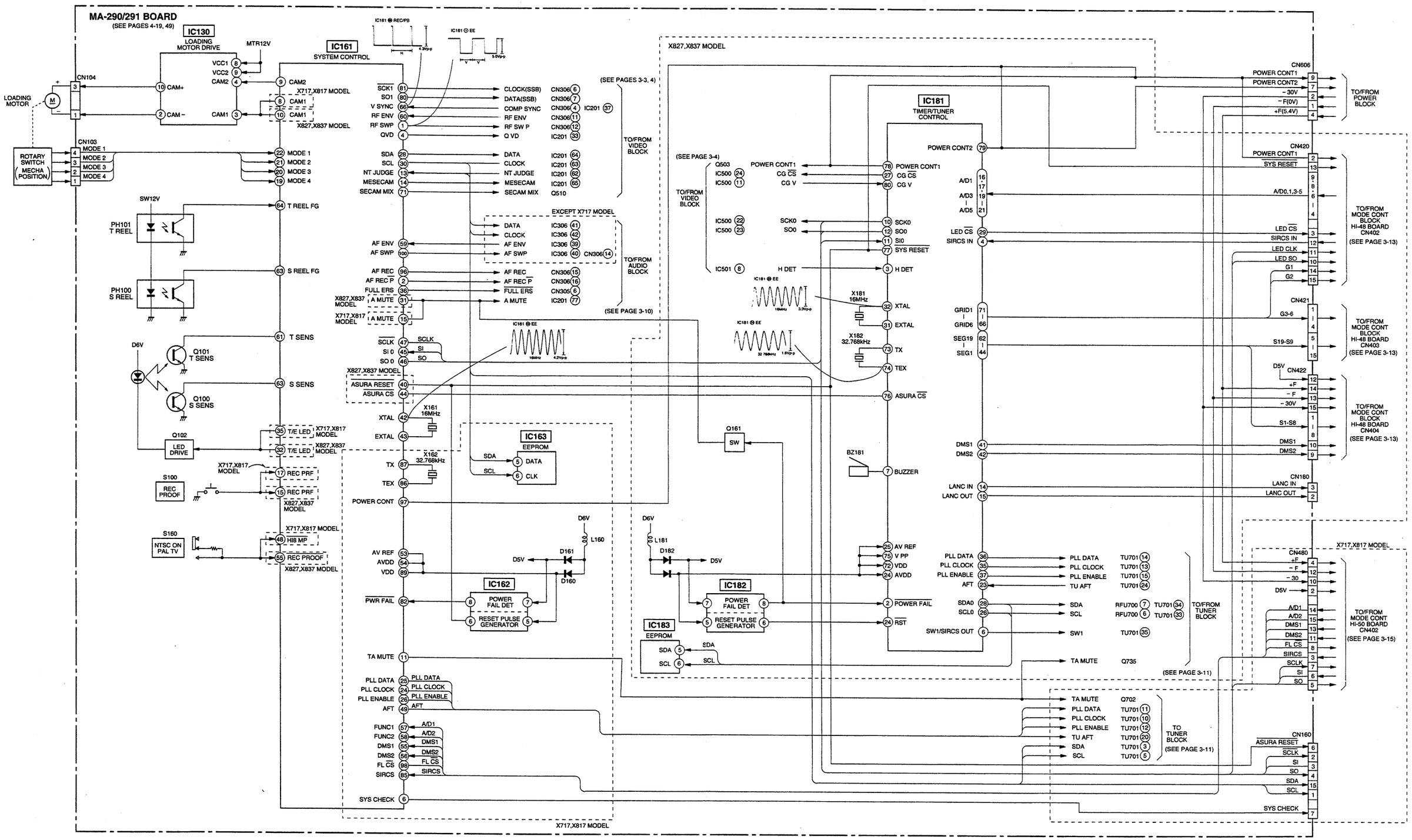
3-2. VIDEO BLOCK DIAGRAM



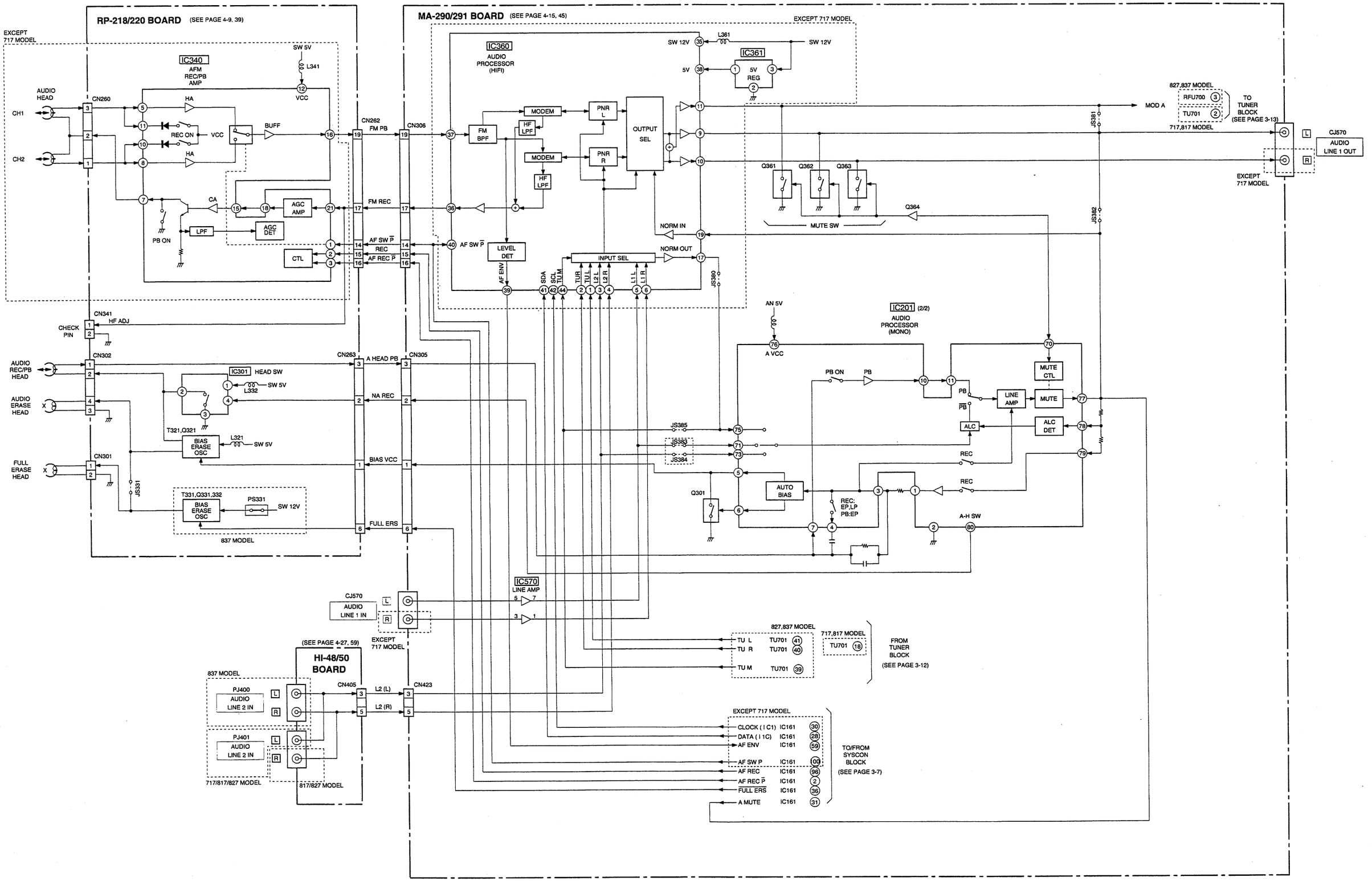
3-3. SERVO BLOCK DIAGRAM



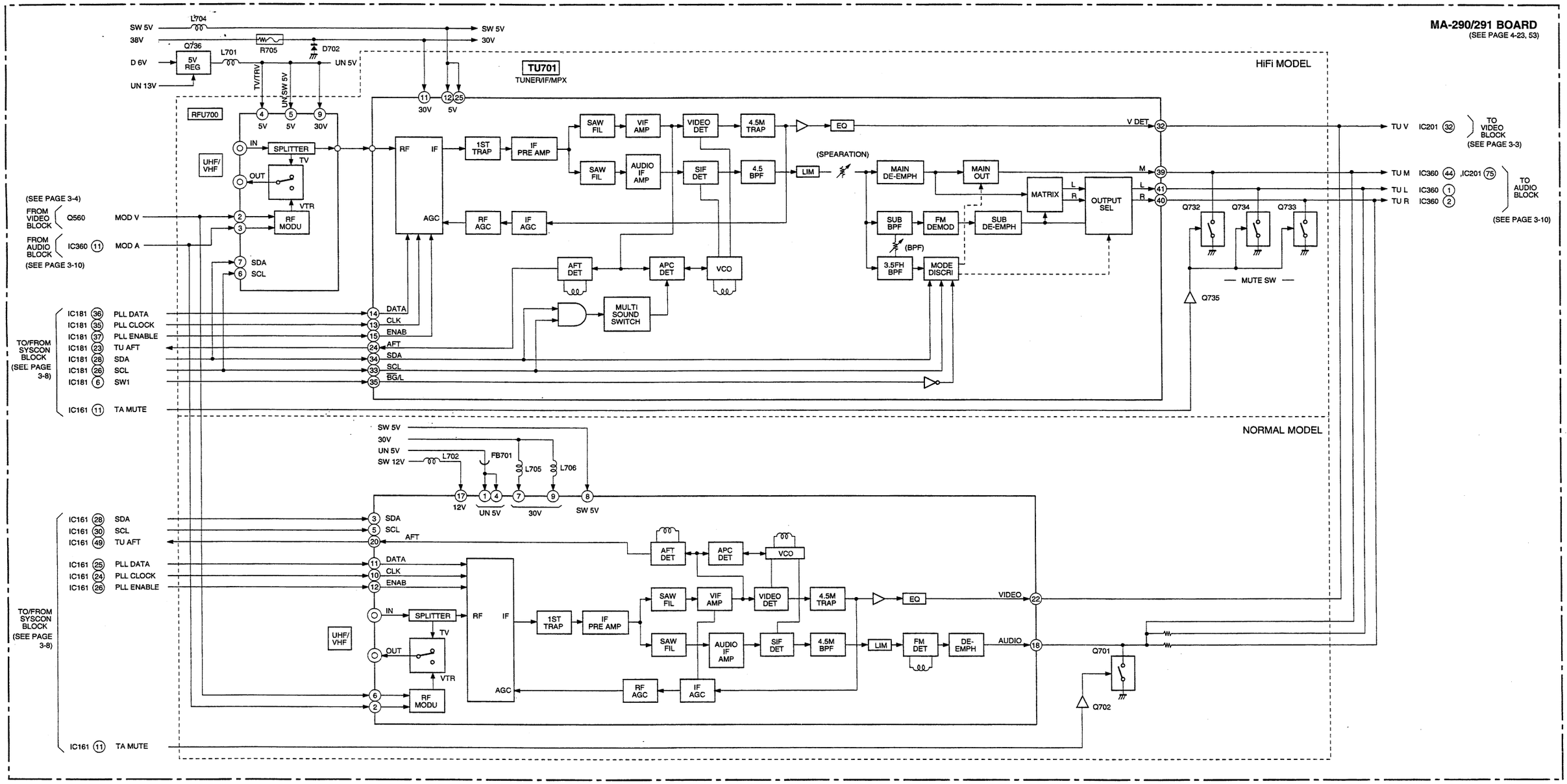
3-4. SYSTEM CONTROL BLOCK DIAGRAM



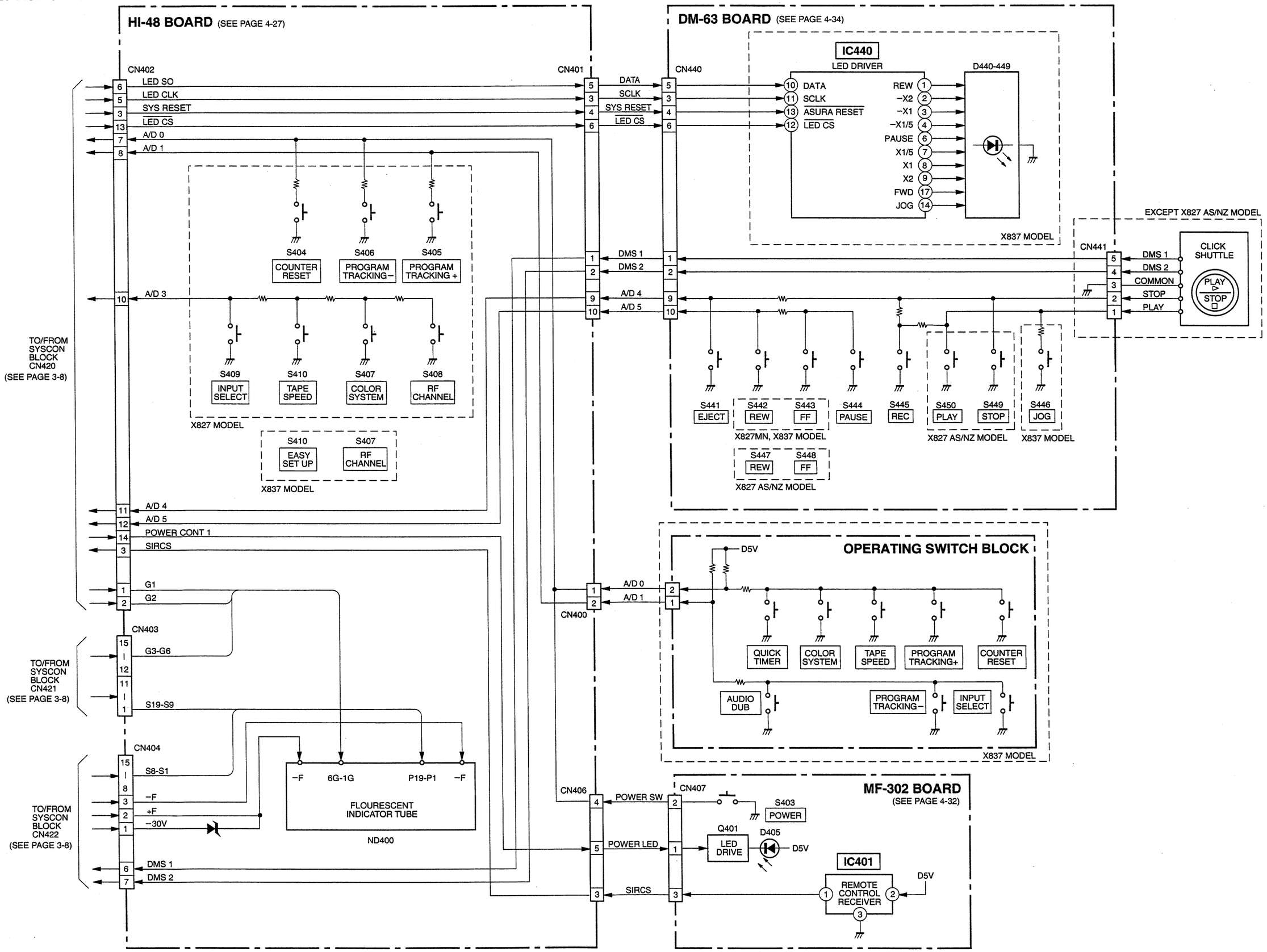
3-5. AUDIO BLOCK DIAGRAM



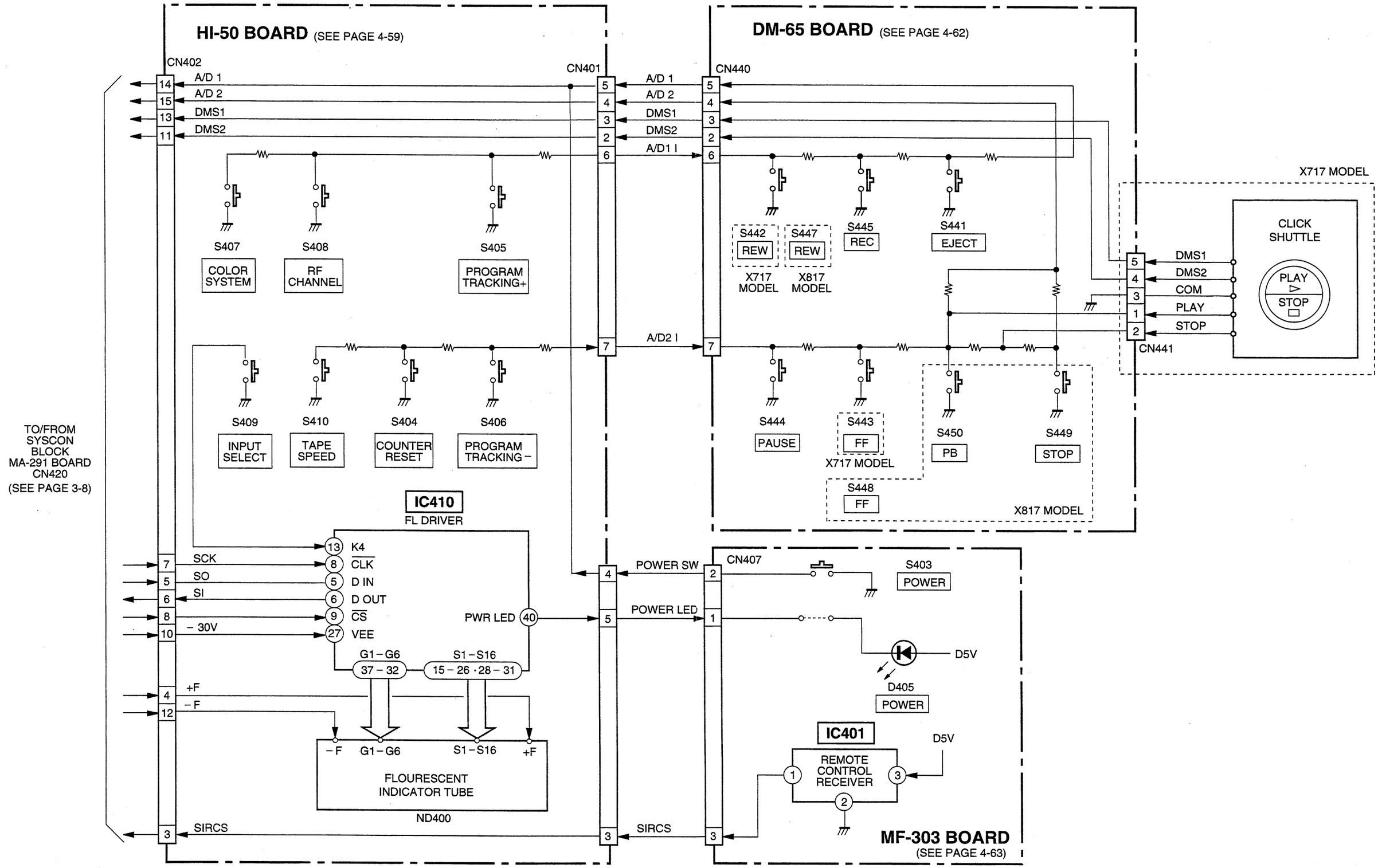
3-6. TUNER BLOCK DIAGRAM



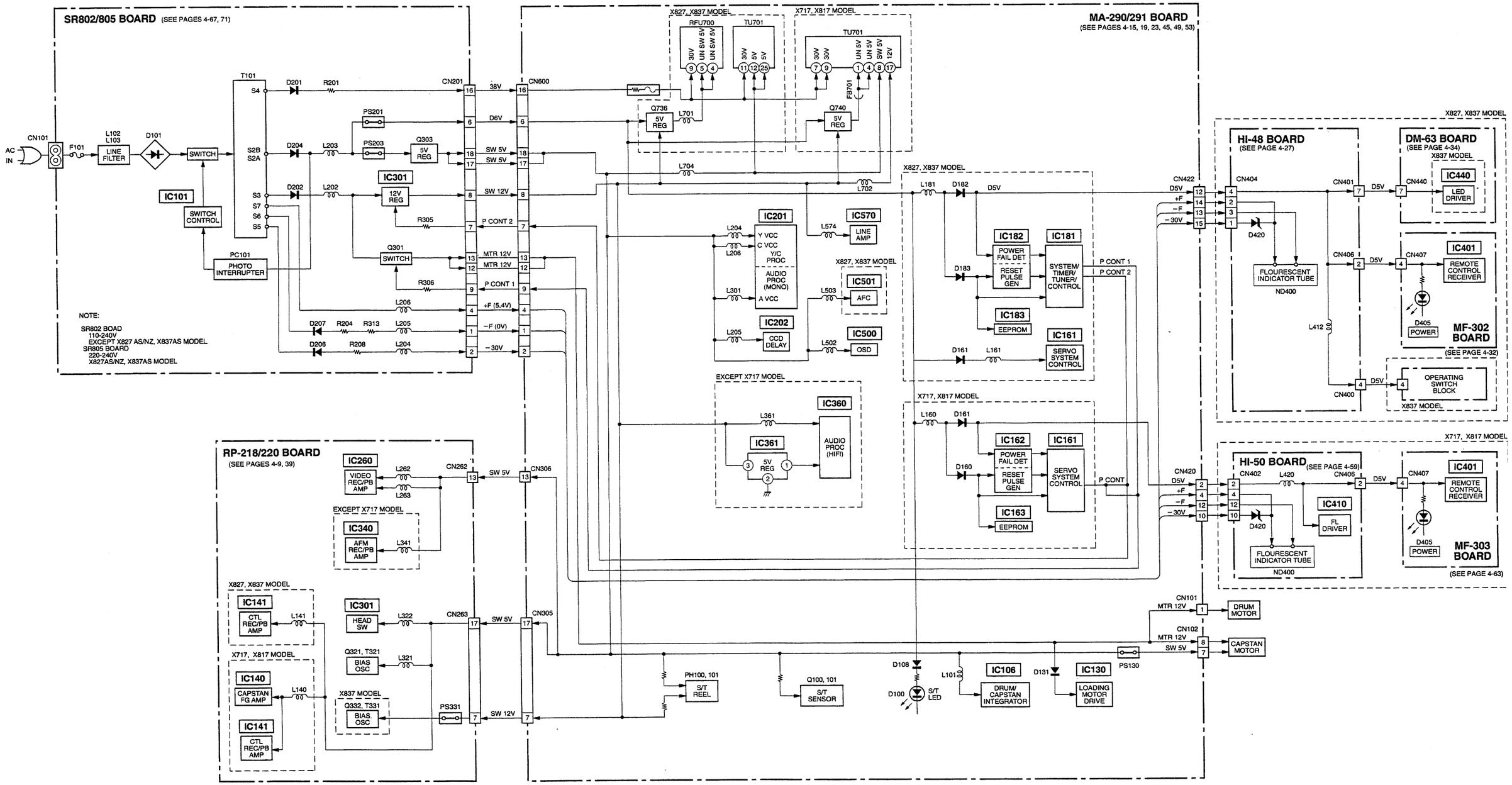
3-7. SLV-X827/X837 MODE CONTROL BLOCK DIAGRAM



3-8. SLV-X717/X817 MODE CONTROL BLOCK DIAGRAM



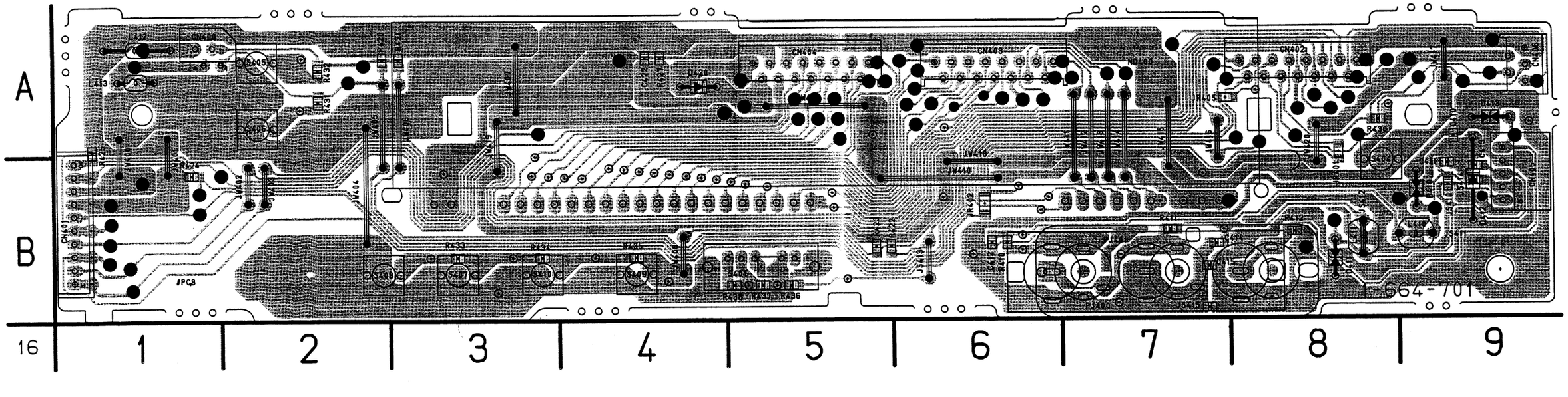
3-9. POWER SUPPLY BLOCK DIAGRAM

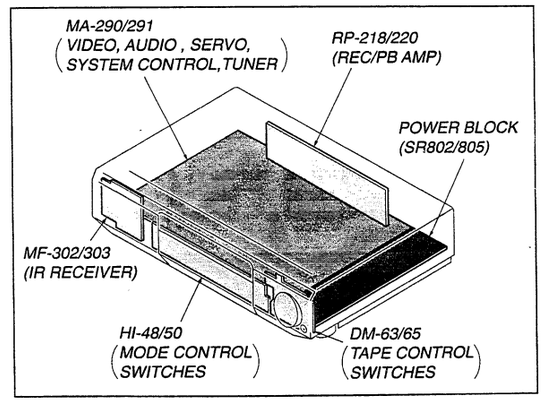


HI-48 (MODE CONTROL SWITCHES) PRINTED WIRING BOARD
— Ref. No. HI-48 Board; 3,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

HI-48 BOARD (CONDUCTOR SIDE)

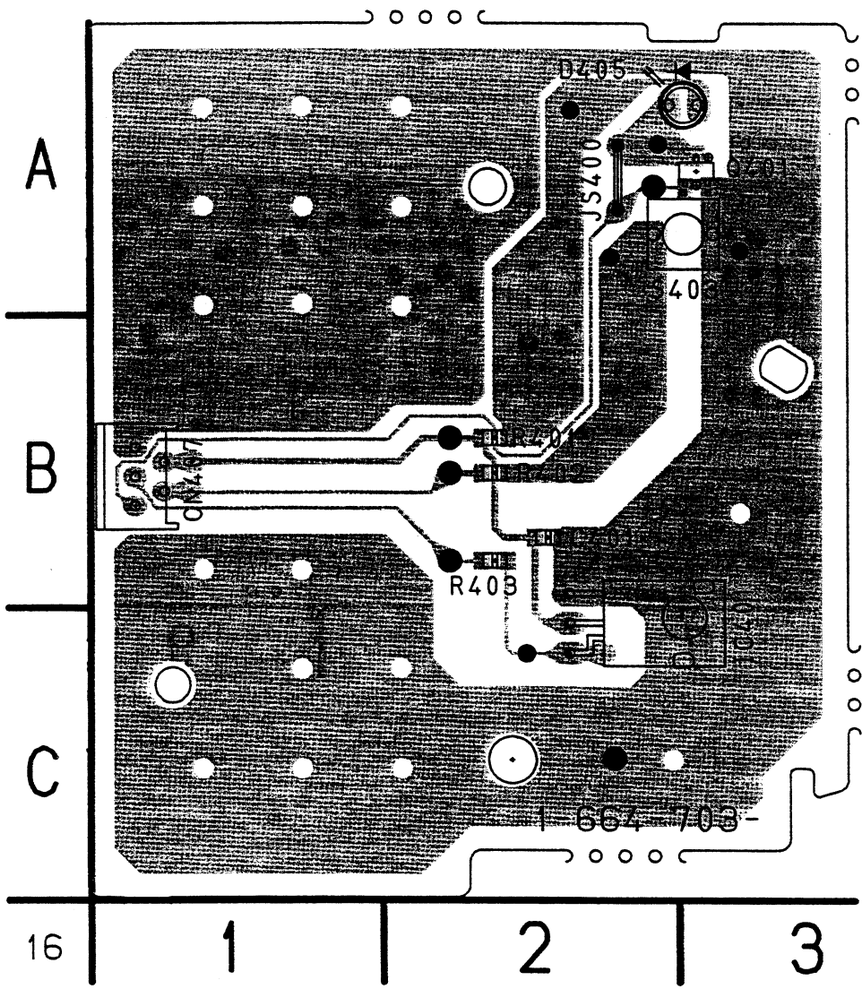


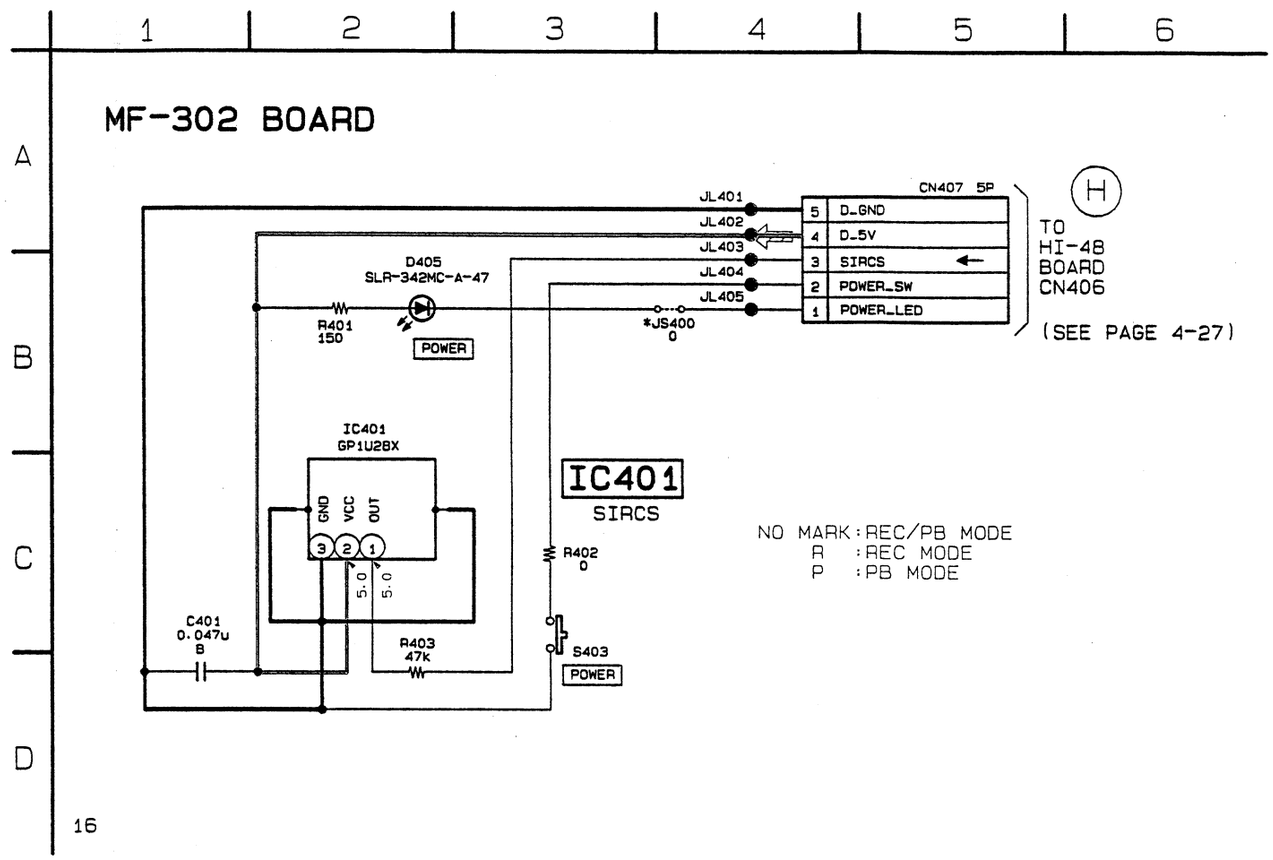


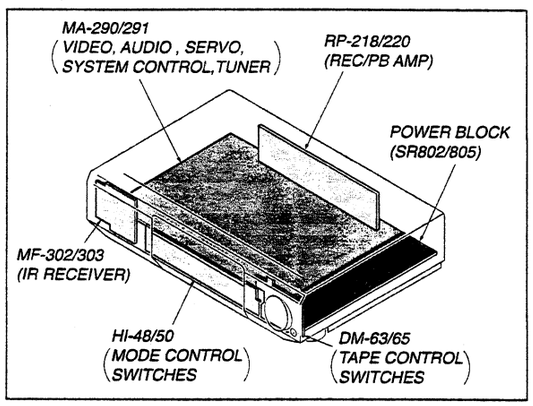
MF-302 (IR. RECEIVER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM
— Ref. No. MF-302 Board; 3,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

MF-302 BOARD (CONDUCTOR SIDE)

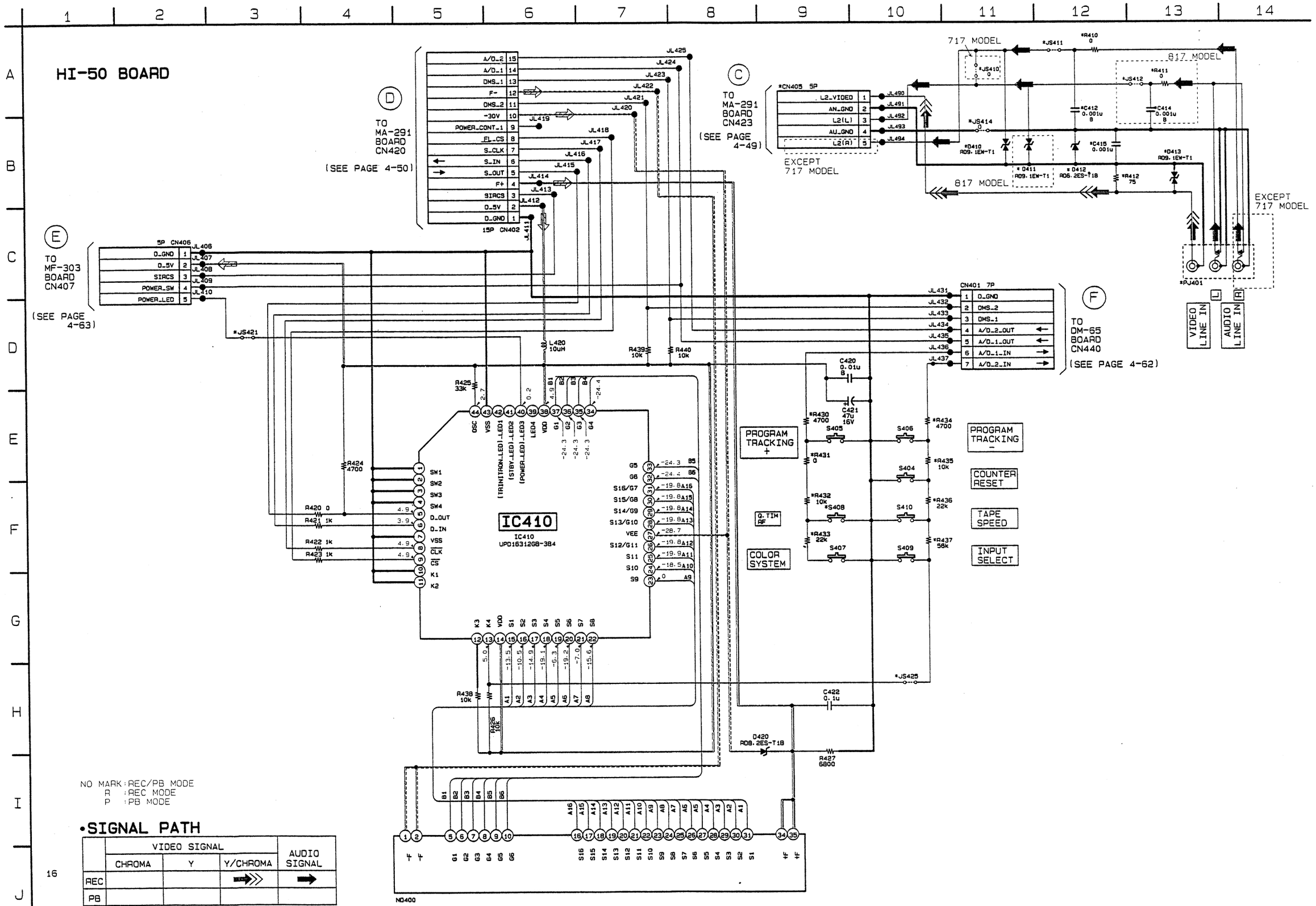






HI-50 (MODE CONTROL SWITCHES) SCHEMATIC DIAGRAM
— Ref. No. HI-50 Board; 4,000 Series —

• See page 4-57 for HI-50 BOARD printed wiring board.



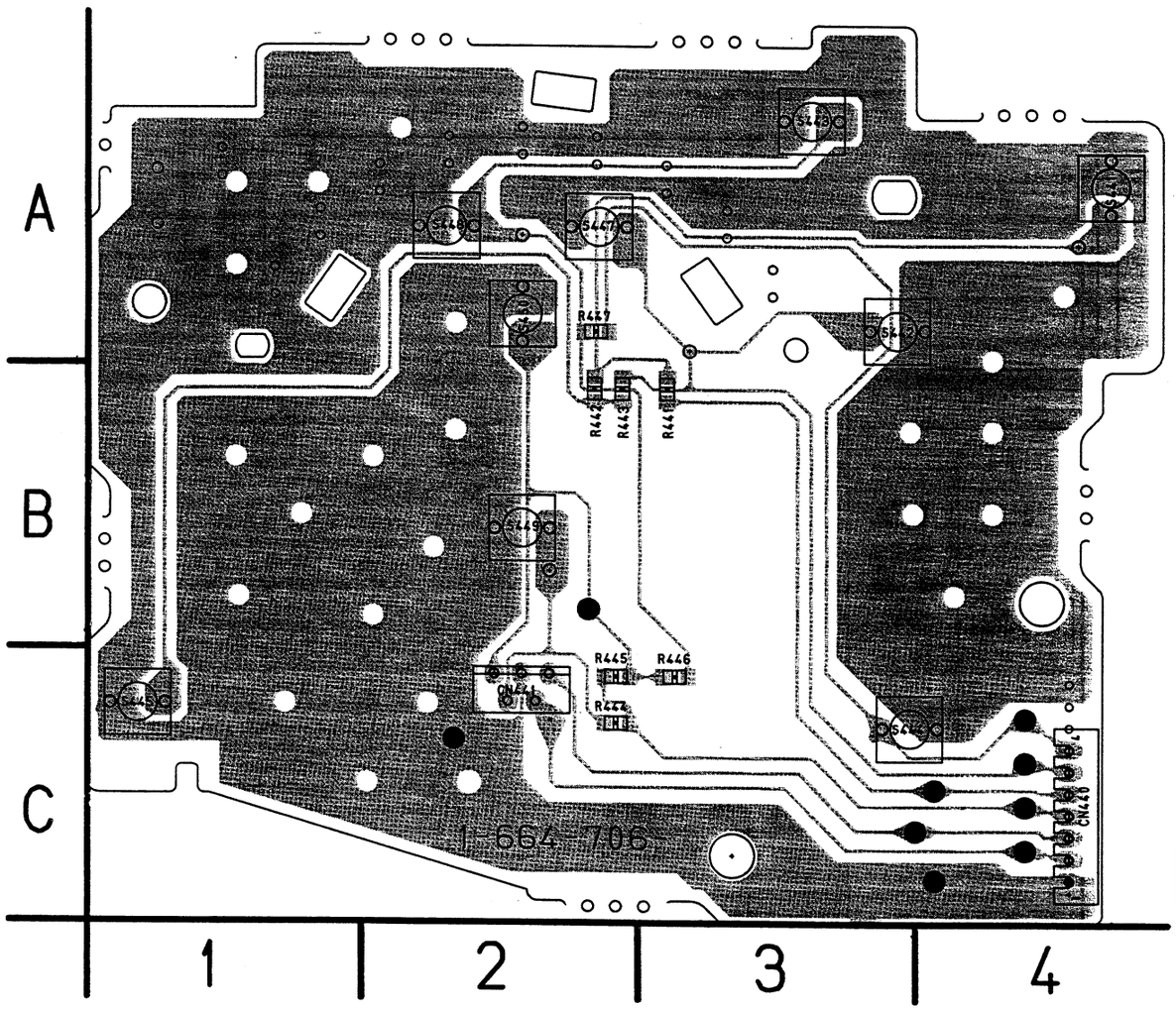
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE

•SIGNAL PATH

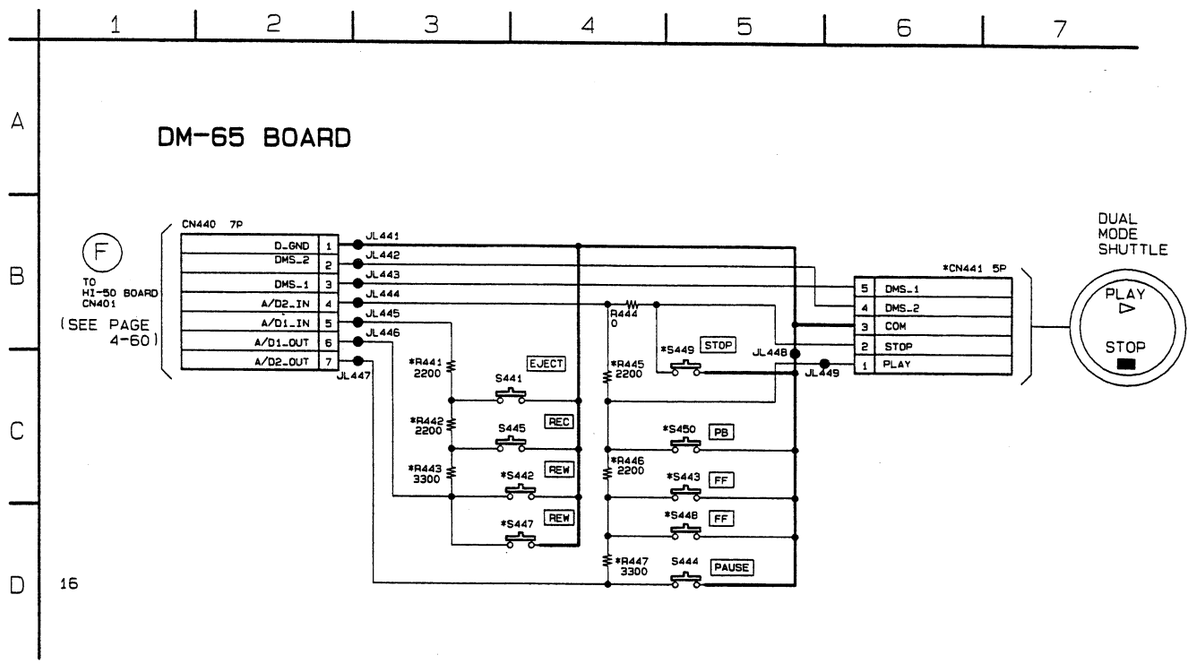
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB				

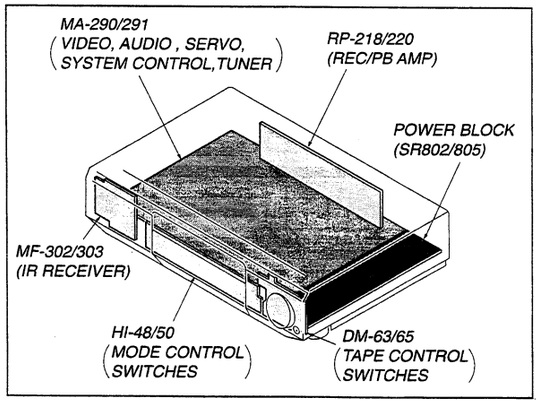
DM-65 (TAPE CONTROL SWITCHES) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM
— Ref. No. DM-65 Board; 4,000 Series —

DM-65 BOARD (CONDUCTOR SIDE)



There are few cases that the part printed on this diagram isn't mounted in this model.

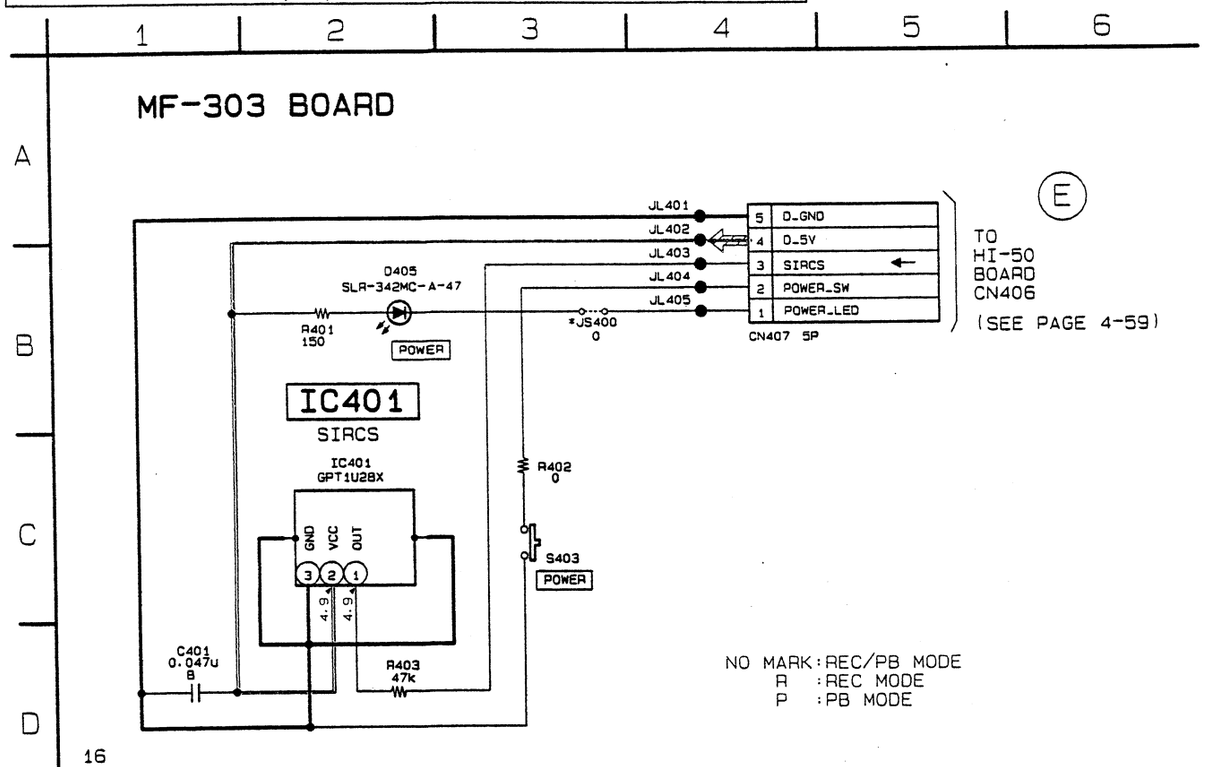




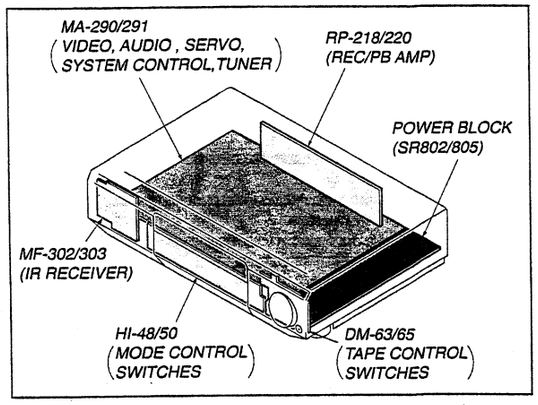
MF-303 (IR. RECEIVER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

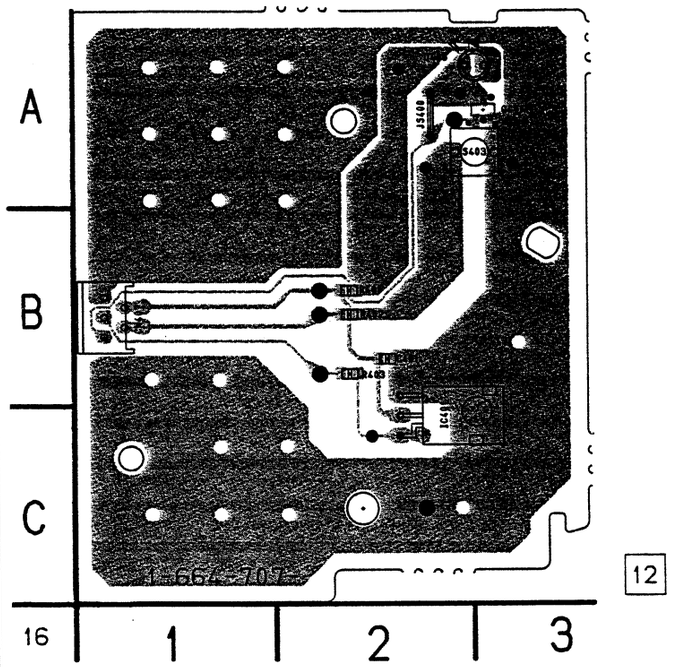
— Ref. No. MF-303 Board; 4,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.



MF-303 BOARD (CONDUCTOR SIDE)





IR. RECEIVER
MF-303

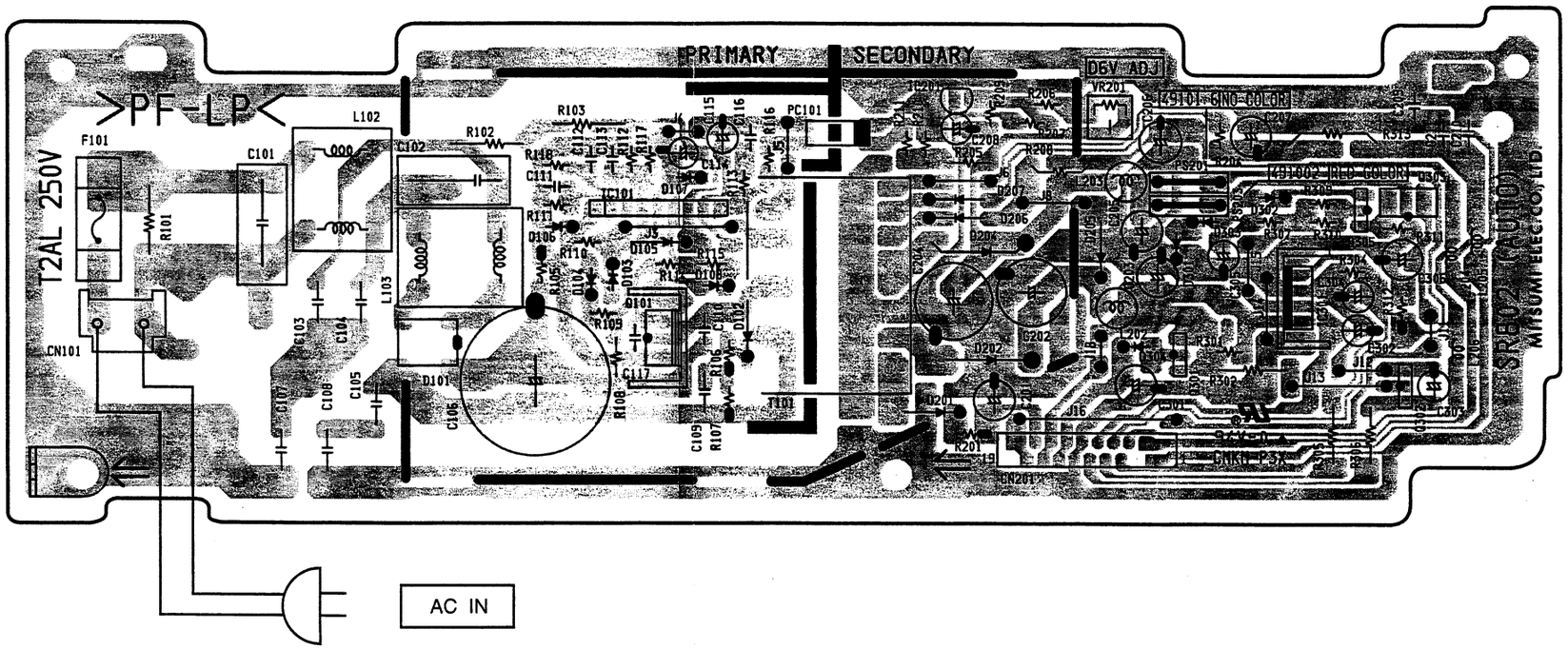
4-5. POWER BLOCK (SWITCHING REGULATOR) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

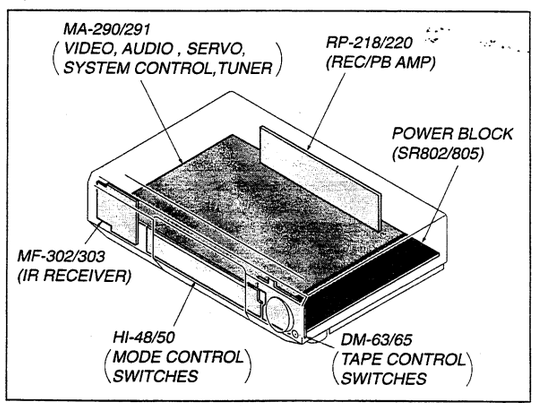
POWER BLOCK SR802 (EXCEPT SLV-X827AS/X827NZ/X837AS) PRINTED WIRING BOARD

— Ref. No. SR802 Board; 5,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

POWER BLOCK SR802

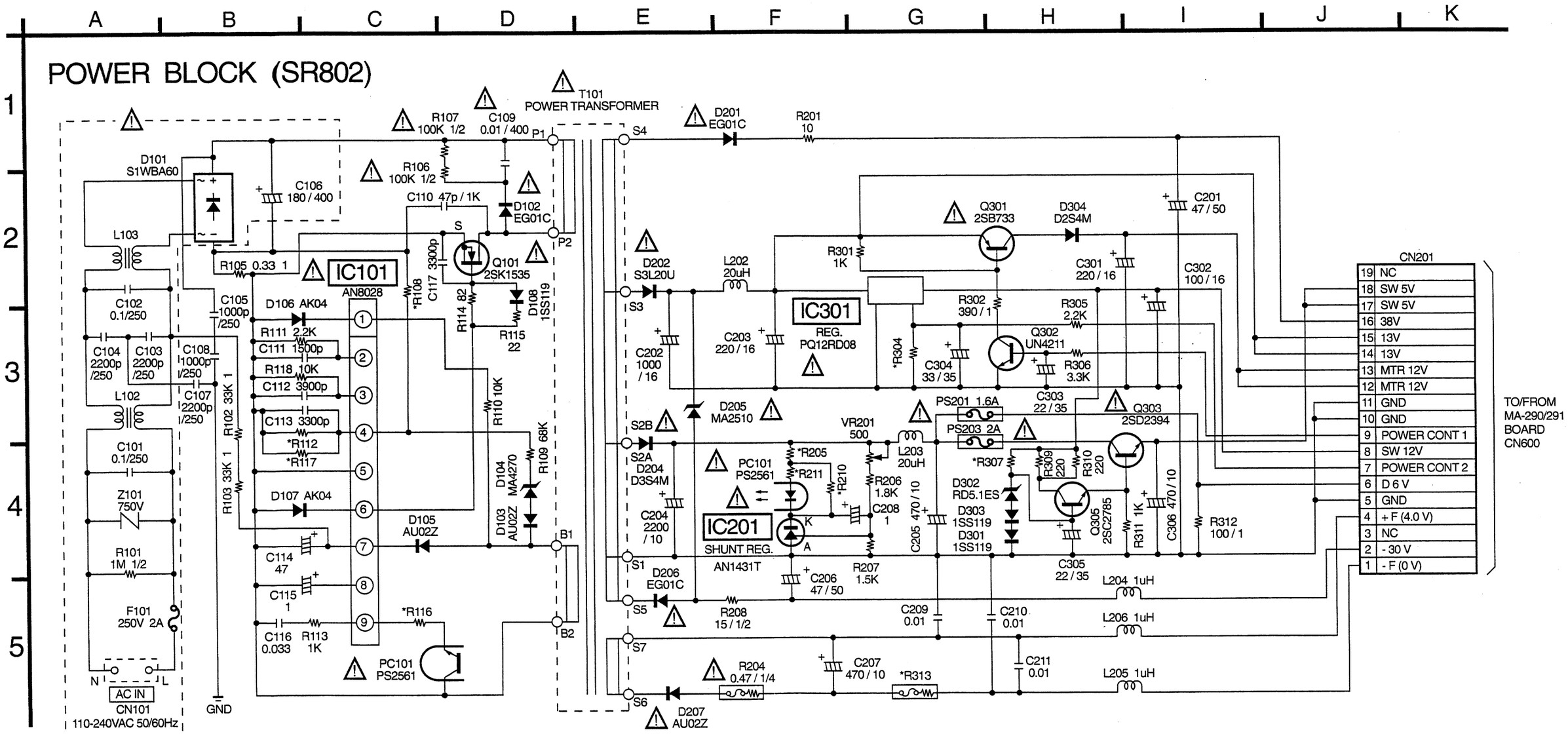




POWER BLOCK SR802 (EXCEPT SLV-X827AS/X827NZ/X837AS) SCHEMATIC DIAGRAM

— Ref. No. SR802 Board; 5,000 Series —

• See page 4-65 for SR802 BOARD printed wiring board.



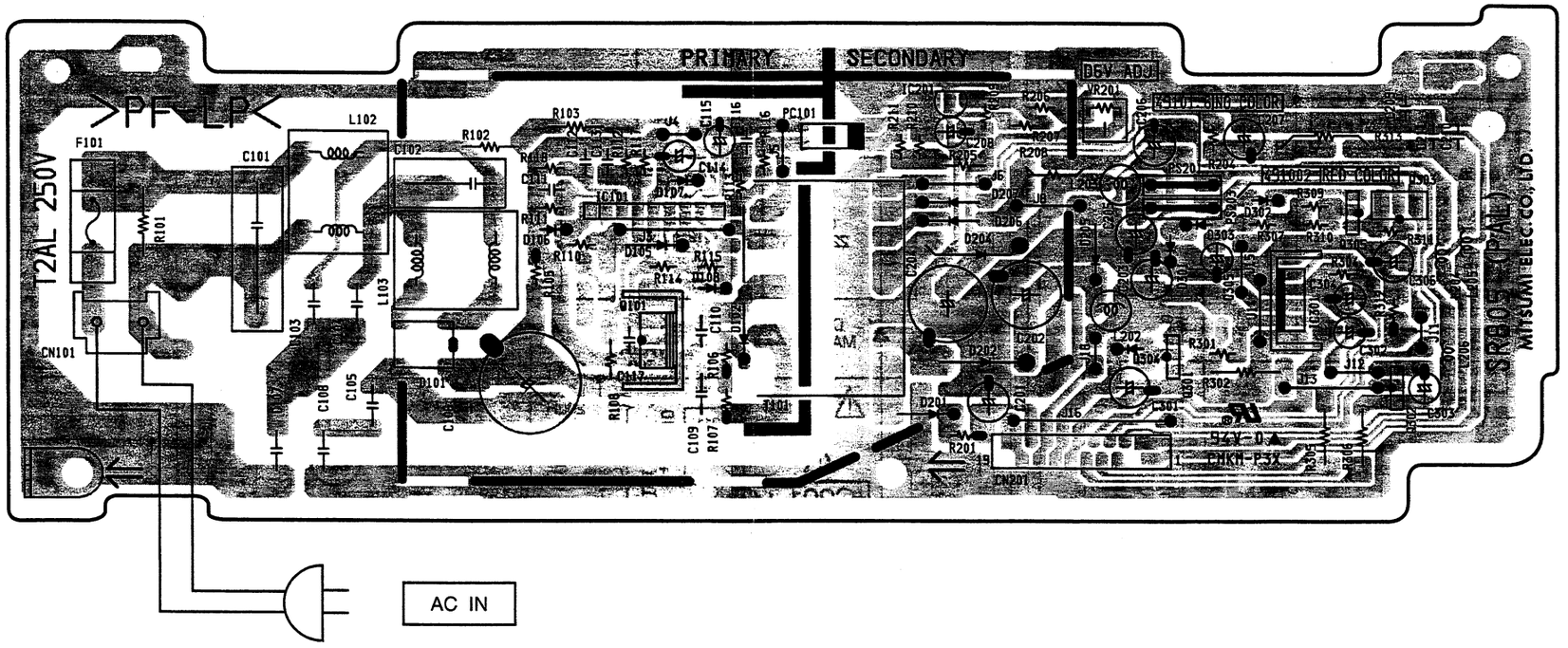
Ref.No.	min	typ	max	Symbol	min	typ	max
*R108	470 1/2	470 1/2	500 1/2	*R210	—	3.3K	5.6K
*R112	270	330	330	*R211	220	1K	1.5K
*R116	1.5K	1.8K	2.2K	*R304		—	—
*R117	—	—	100K	*R307	380	560	1K
*R205	—	—	—	*R313	2.2 1/4	2.7 1/4	3.9 1/4

Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace onl y with part number specified.

POWER BLOCK SR805 (SLV-X827AS/X827NZ/X837AS) PRINTED WIRING BOARD
— Ref. No. SR805 Board; 6,000 Series —

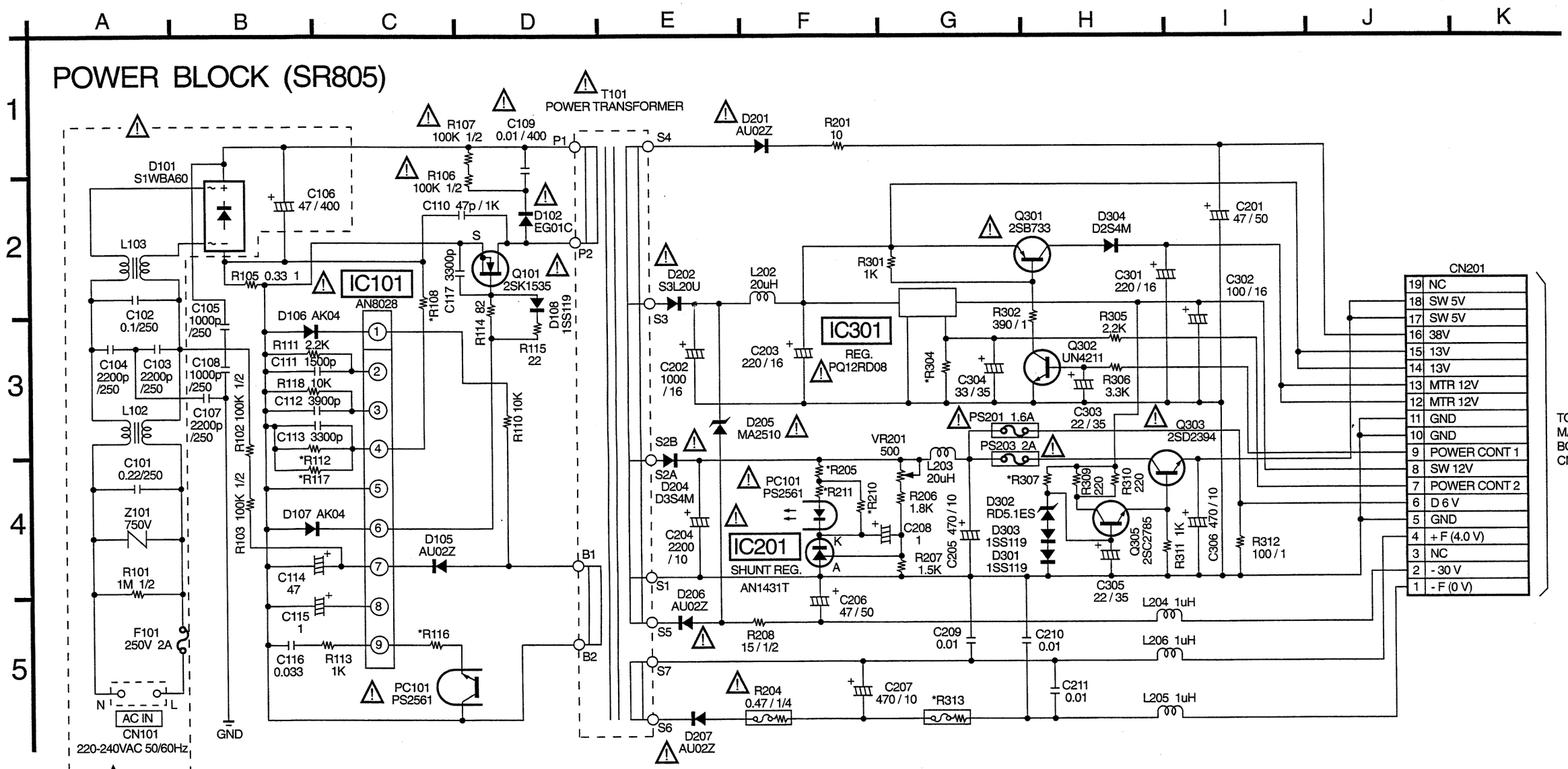
There are few cases that the part printed on this diagram isn't mounted in this model.

POWER BLOCK SR805



POWER BLOCK SR805 (SLV-X827AS/X827NZ/X837AS) SCHEMATIC DIAGRAM
— Ref. No. SR805 Board; 6,000 Series —

• See page 4-69 for SR805 BOARD printed wiring board.



Ref.No.	min	typ	max	Ref.No.	min	typ	max
*R108	330 1/2	470 1/2	680 1/2	*R210	—	3.3K	5.6K
*R112	270	330	330	*R211	220	1K	1.5K
*R116	1.5K	1.8K	2.2K	*R304		—	—
*R117	—	—	100K	*R307	380	560	1K
*R205	—	—	—	*R313	2.2 1/4	2.7 1/4	3.9 1/4

Note:
The components indentified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace onl y with part number specified.

SLV-X717ME/X717PS/X717SG/X817ME/X817PS/X817SG/ X827AS/X827MN/X827NZ/X837AS/X837ME/X837MN

SECTION 5
REPAIR PARTS LIST

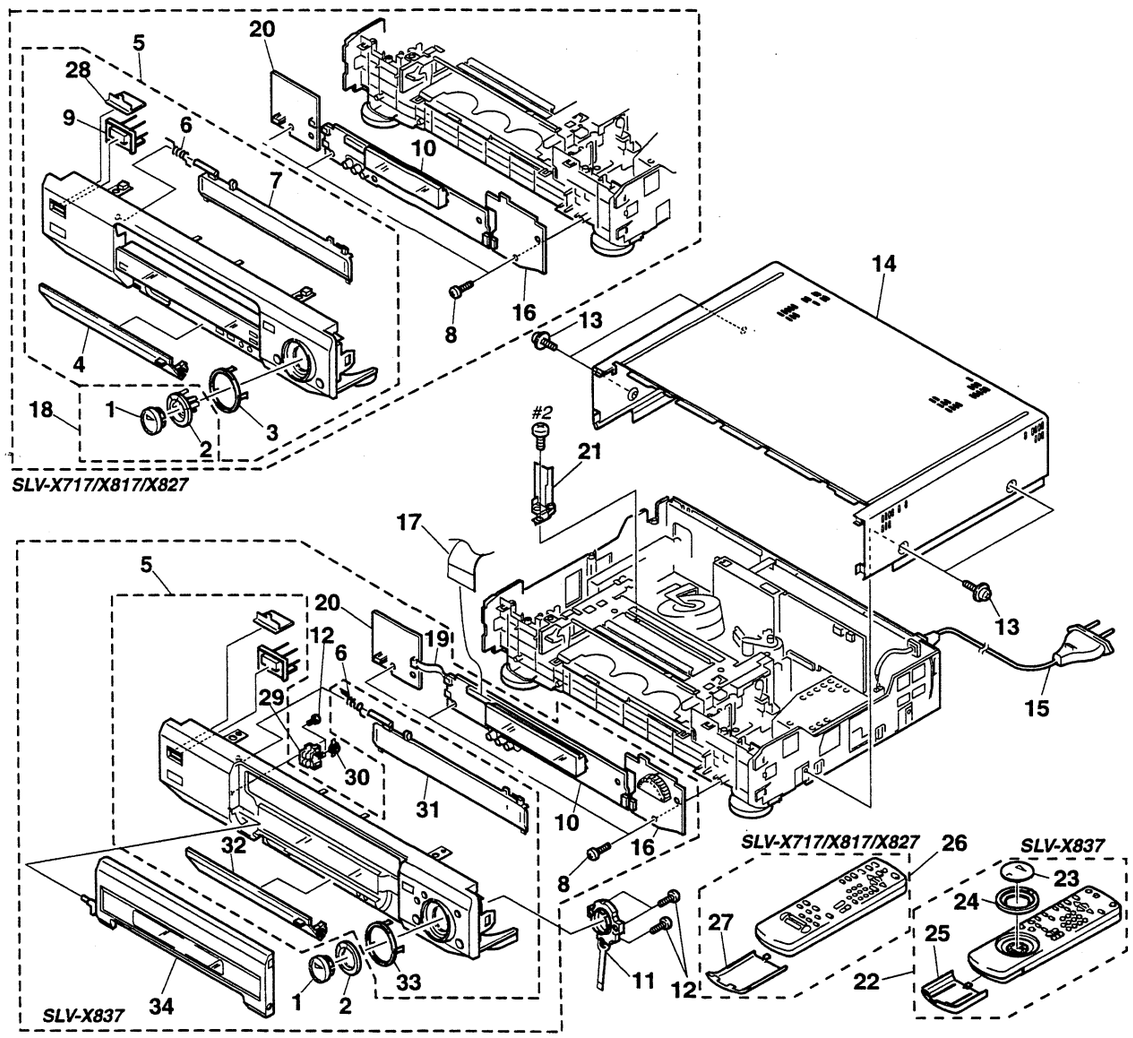
5-1. EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

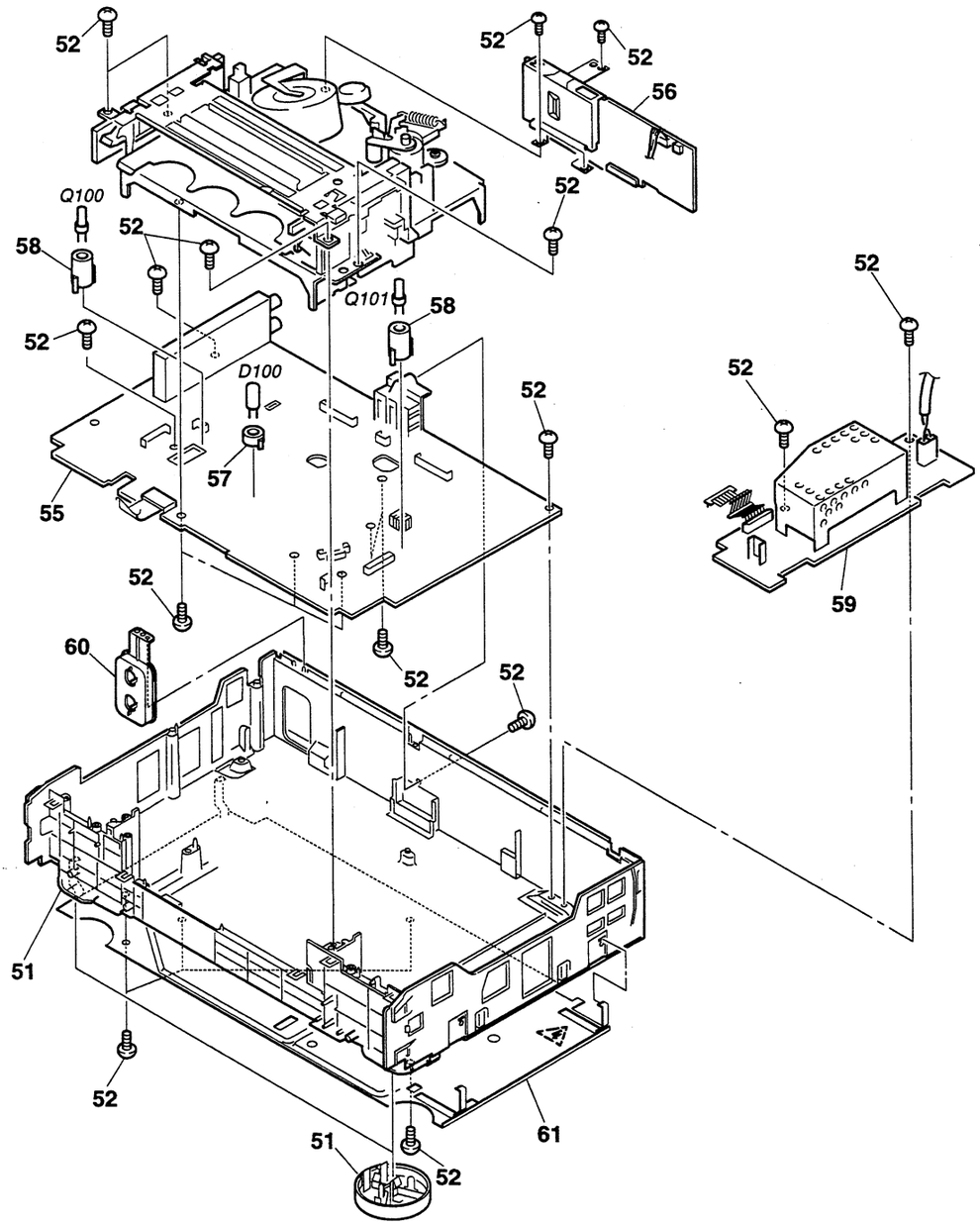
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

5-1-1. FRONT PANEL ASSEMBLY AND CASE



Ref. No.	Part No.	Description	Remarks
1	3-972-782-01	BUTTON, CENTER (837AS)	
1	3-972-782-51	BUTTON, CENTER (717,827MN,837MN,837ME)	
2	3-972-783-01	RING, JOG (837)	
2	3-973-077-01	RING, CHANGE SPEED (717,827MN)	
* 3	3-972-781-01	PLATE, RING ORNAMENTAL(717,827MN)	
* 3	3-972-781-11	PLATE, RING ORNAMENTAL(817,827AS,827NZ)	
4	3-970-162-51	DOOR (A), JACK(817)	
4	3-970-162-71	DOOR (A), JACK(717)	
4	3-974-145-51	DOOR (A), JACK (827)	
5	X-3946-743-1	PANEL ASSY, FRONT(827MN)	
5	X-3946-934-1	PANEL ASSY, FRONT(717)	
5	X-3946-935-1	PANEL ASSY, FRONT(817)	
5	X-3946-949-1	PANEL ASSY, FRONT(827AS)	
5	X-3946-950-1	PANEL ASSY, FRONT(827NZ)	
5	X-3946-951-1	PANEL ASSY, FRONT(837ME,837MN)	
5	X-3946-953-1	PANEL ASSY, FRONT(837AS)	
6	3-953-432-01	SPRING (GE), FL	
7	3-972-774-01	DOOR, CASSETTE(827AS,827NZ)	
7	3-972-774-21	DOOR, CASSETTE(817)	
7	3-973-517-01	DOOR, CASSETTE(827MN)	
7	3-973-517-11	DOOR, CASSETTE(717,827MN)	
8	3-970-608-21	SUMITITE (B3), +BV	
9	3-966-213-01	BUTTON, POWER (827AS,827NZ)	
9	3-966-213-11	BUTTON, POWER (717,817,827MN)	
* 10	A-6791-155-A	HI-48 COMPLETE PCB BOARD, COMPLETE (837)	
* 10	A-6791-160-A	HI-48 COMPLETE PCB BOARD, COMPLETE (827)	
* 10	A-6791-164-A	HI-50 COMPLETE PCB BOARD, COMPLETE (817)	
* 10	A-6791-168-A	HI-50 COMPLETE PCB BOARD, COMPLETE (717)	
11	1-762-844-21	SWITCH, ROTARY(717,827MN)	
11	1-762-844-31	SWITCH, ROTARY(837)	
12	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND (717,827MN,837)	
13	3-710-901-41	SCREW, TAPPING	
* 14	3-972-787-01	CASE (LS), UPPER (827AS,827NZ,837AS)	
* 14	3-972-787-11	CASE (LS), UPPER (717,817,827MN,837ME,837MN)	
⚠15	1-777-851-41	CORD, POWER (717,817,827MN,837MN,837ME)	
⚠15	1-777-855-41	CORD, POWER(827AS,827NZ,837AS)	
* 16	A-6791-158-A	DM-63 COMPLETE PCB BOARD, COMPLETE (827MN)	
* 16	A-6791-159-A	DM-63 COMPLETE PCB BOARD, COMPLETE (827AS,827NZ)	
* 16	A-6791-163-A	DM-65 COMPLETE PCB BOARD, COMPLETE (817)	
* 16	A-6791-167-A	DM-65 COMPLETE PCB BOARD, COMPLETE (717,817)	
* 16	A-6791-266-A	DM-63 COMPLETE PCB BOARD, COMPLETE (837)	
17	1-777-962-12	CABLE, FLAT (FMH-14) 15P	
18	X-3946-598-1	BUTTON ASSY, FUNCTION (817)	
19	1-777-963-11	CABLE, FLAT (FHM-3) 5P	
* 20	A-6791-170-A	MF-303 COMPLETE PCB BOARD, COMPLETE (717,817)	
* 20	A-6791-265-A	MF-302 COMPLETE PCB BOARD, COMPLETE (827,837)	
21	X-3946-864-1	TC (N17) ASSY (717,817,827MN,837ME,837MN)	
22	1-475-028-41	REMOTE COMMANDER (RMT-V195D)(837)	
23	3-972-850-01	BUTTON, FUNCTION (837)	
24	3-972-783-21	RING, JOG (837)	
25	3-709-126-01	COVER, BATTERY (837)	
26	1-475-026-21	REMOTE COMMANDER (RMT-V198D)(717,817)	
26	1-475-033-11	REMOTE COMMANDER (RMT-V204) (827)	
27	3-709-128-01	COVER, BATTERY (827)	
27	3-709-133-01	COVER, BATTERY (717,817)	
28	3-946-611-01	TIP, POWER BUTTON (717,817,827)	
* 29	3-960-076-01	PLATE (LEFT), FULCRUM, DOOR (837)	
30	3-961-745-01	DAMPER, OIL (837)	
31	3-965-769-21	DOOR, CASSETTE(837AS)	
31	3-965-769-31	DOOR, CASSETTE(837MN,837ME)	
32	3-966-244-71	DOOR (B), JACK(837MN,837ME)	
32	3-966-244-81	DOOR (B), JACK(837AS)	
* 33	3-972-805-01	PLATE (LE), RING ORNAMENTAL(837)	
34	1-475-008-31	SWITCH BLOCK, CONTROL (837MN,837ME)	
34	1-475-008-41	SWITCH BLOCK, CONTROL (837AS)	

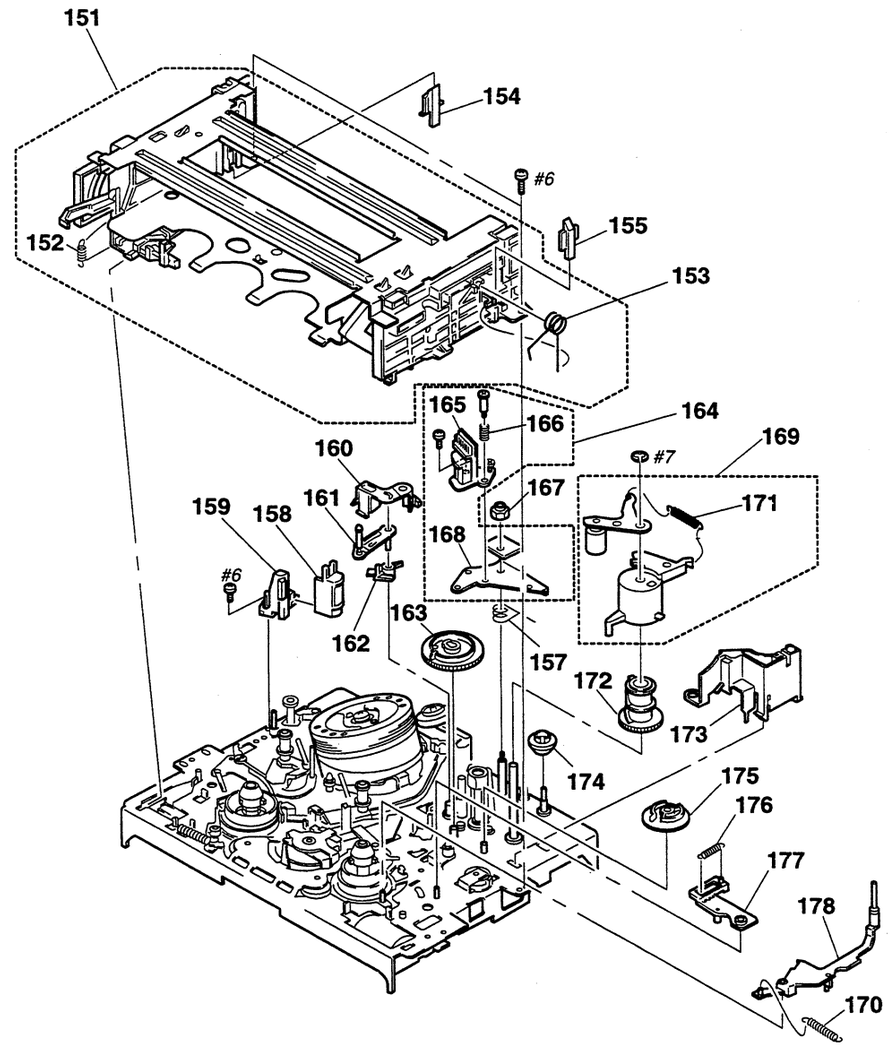
5-1-2. CHASSIS ASSEMBLY



Ref. No.	Part No.	Description	Remarks
51	3-966-229-01	INSULATOR (ST)(827,837AS)	
51	3-966-229-31	INSULATOR (ST) (717,817,827MN,837MN,837ME)	
52	3-970-608-21	SUMITITE (B3), +BV	
* 55	A-6791-154-A	MA-290 COMPLETE PCB BOARD, COMPLETE (837ME,837MN)	
* 55	A-6791-157-A	MA-290 COMPLETE PCB BOARD, COMPLETE (837AS)	
* 55	A-6791-162-A	MA-290 COMPLETE PCB BOARD, COMPLETE (827AS)	
* 55	A-6791-166-A	MA-291 COMPLETE PCB BOARD, COMPLETE (817)	
* 55	A-6791-171-A	MA-291 COMPLETE PCB BOARD, COMPLETE (717)	
* 55	A-6791-178-A	MA-290 COMPLETE PCB BOARD, COMPLETE (827NZ)	
* 55	A-6796-429-A	MA-290 COMPLETE PCB BOARD, COMPLETE (827MN)	
* 56	A-6791-156-A	RP-218 COMPLETE PCB BOARD, COMPLETE (837)	
* 56	A-6791-161-A	RP-218 COMPLETE PCB BOARD, COMPLETE (827)	
* 56	A-6791-165-A	RP-220 COMPLETE PCB BOARD, COMPLETE (817)	
* 56	A-6791-169-A	RP-220 COMPLETE PCB BOARD, COMPLETE (717)	
* 57	3-960-274-01	SPACER, LED	
* 58	3-960-273-01	SPACER TOP/END	
⚠59	1-468-186-11	POWER BLOCK (717,817,827MN,837ME,837MN)	
⚠59	1-468-187-11	POWER BLOCK (827AS,827NZ,837AS)	
* 60	3-972-790-11	PLATE (TU), REAR JACK (717,817)	
* 60	3-973-520-01	PLATE (TU-PAL), REAR JACK(827,837)	
* 61	3-972-786-01	PLATE (LS), BOTTOM	
D100	8-719-048-26	DIODE GL528V2	
Q100	8-729-025-92	PHOTOTRANSISTOR PT380F	
Q101	8-729-025-92	PHOTOTRANSISTOR PT380F	

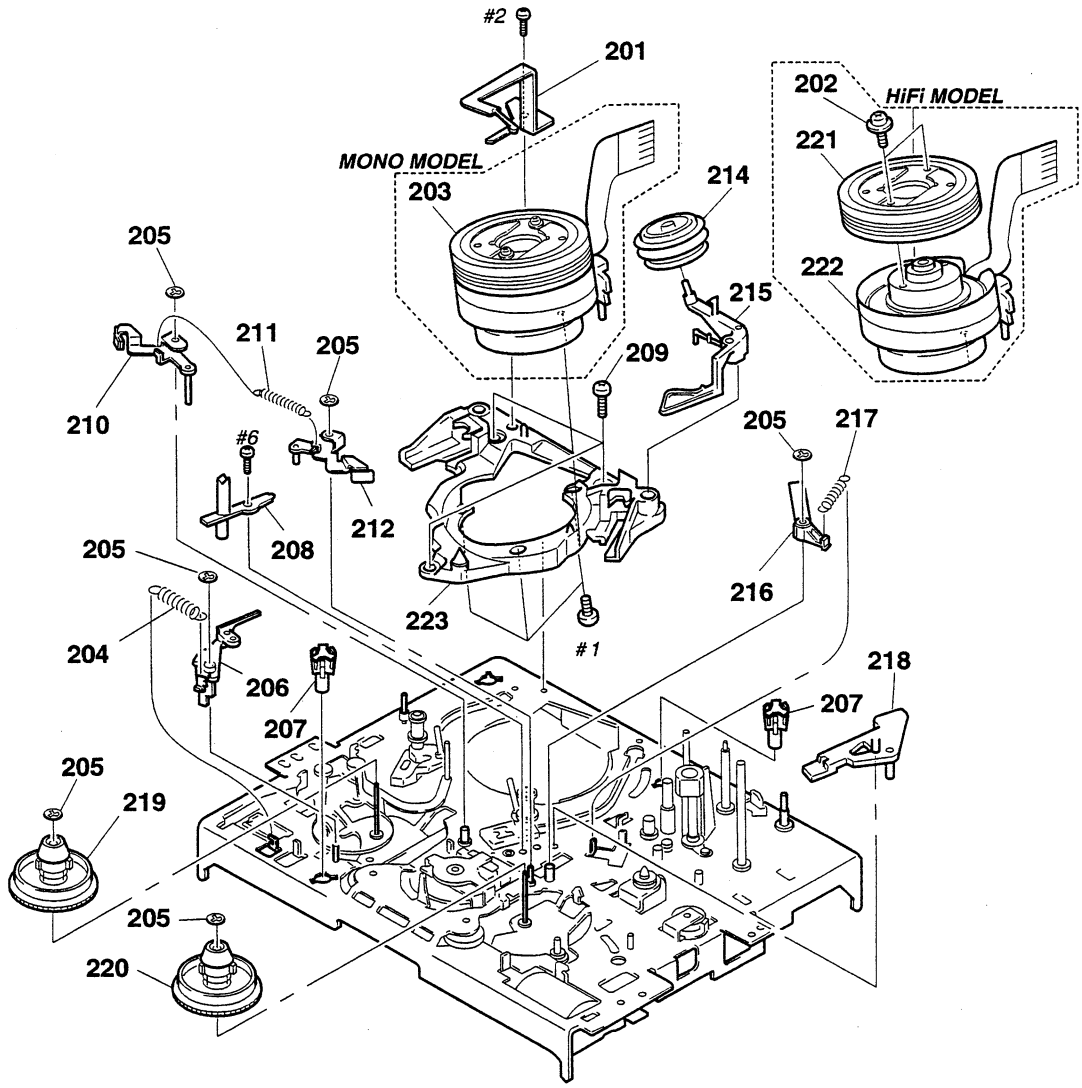
Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

5-1-3. MECHANISM DECK ASSEMBLY-1



Ref. No.	Part No.	Description	Remarks
151	A-6759-603-A	FL BLOCK ASSY	
152	3-958-467-01	SPRING, TENSION COIL	
153	3-970-471-01	SPRING, TORSION	
154	3-958-488-03	PLATE, LIGHT GUIDE, END SENSOR	
155	3-970-473-01	PLATE, LIGHT GUIDE, TOP SENSOR	
157	3-958-487-01	SPRING, (ACE) TORSION COIL	
158	1-500-144-11	HEAD, FE	
159	X-3945-348-2	FEH ASSY	
160	3-962-298-01	BRACKET, TG7 TAPE	
161	X-3944-797-1	TG8 ASSY	
162	3-958-421-01	HOLDER, TG8	
163	3-958-152-01	GEAR, TG8	
164	A-6736-105-A	ACE BLOCK ASSY	
165	1-506-485-11	PIN, CONNECTOR 6P	
166	3-960-439-02	SPRING (ACE), COMPRESSION	
167	3-942-867-01	NUT, AC HEIGHT ADJUSTMENT	
168	3-958-491-01	BASE, ACE	
169	A-6746-072-A	PRESS BLOCK ASSY, PINCH	
170	3-958-505-01	SPRING (SOFT BRAKE T), TENSION	
171	3-958-455-01	SPRING (PINCH), TENSION	
172	3-958-151-01	GEAR, ELEVATOR	
173	3-958-454-01	OPNER, LID	
174	3-958-501-01	SCREW, ACE ADJUSTMENT	
175	3-958-153-01	GEAR, PRESS	
176	3-958-462-01	SPRING (RVS BRAKE), TENSION	
177	X-3943-885-1	ARM ASSY, RVS BRAKE	
178	X-3943-882-1	BRAKE (T) ASSY, SOFT	

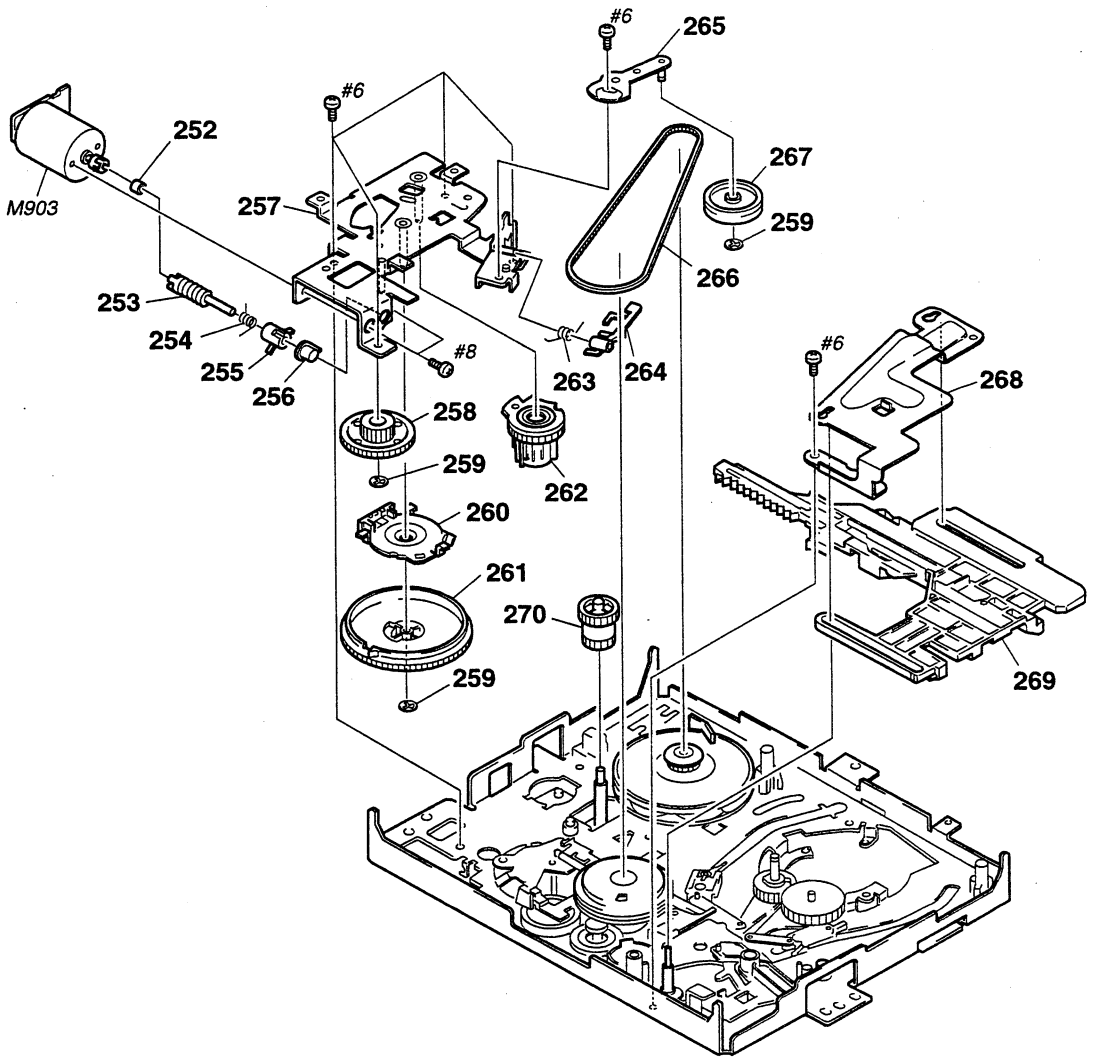
5-1-4. MECHANISM DECK ASSEMBLY-2



Ref. No.	Part No.	Description	Remarks
201	X-3943-899-8	GROUND ASSY, SHAFT	
202	2-643-205-01	SCREW (EXCEPT X717)	
203	8-848-682-11	DRUM ASSY DZH-74B/Q-RP (X717)	
204	3-958-443-01	SPRING, STRETCH COIL SPRING	
205	3-669-595-00	WASHER (2), STOPPER	
206	3-958-450-01	BRAKE (S), SOFT	
207	3-958-390-01	SHAFT, PC BOARD	
208	3-958-391-01	PLATE, LIGHT GUIDE, LED	
209	3-961-441-01	SCREW (3x8)	
210	X-3945-443-1	BRAKE (S) ASSY, MAIN	
211	3-958-517-01	SPRING, TENSIONCOIL	

Ref. No.	Part No.	Description	Remarks
212	X-3945-444-1	ARM (T) ASSY, MAIN BRAKE	
214	X-3947-255-1	ROLLER ASSY, HC	
215	3-975-724-01	ARM, HC	
216	3-960-139-01	ARM, NEUTRALITY	
217	3-958-535-01	SPRING, TENSION	
218	3-960-138-01	ARM, PENDULUM COMPULSION	
219	X-3943-902-1	TABLE, REEL (S) ASSY	
220	X-3943-903-1	TABLE, REEL (T) ASSY	
221	8-848-625-02	UPPER DRUM ASSY DZR-68-R (EXCEPT X717)	
222	8-848-666-11	LOWER DRUM ASSY DZL-51B/J-RP (EXCEPT X717)	
223	3-969-629-01	DRUM BASE	

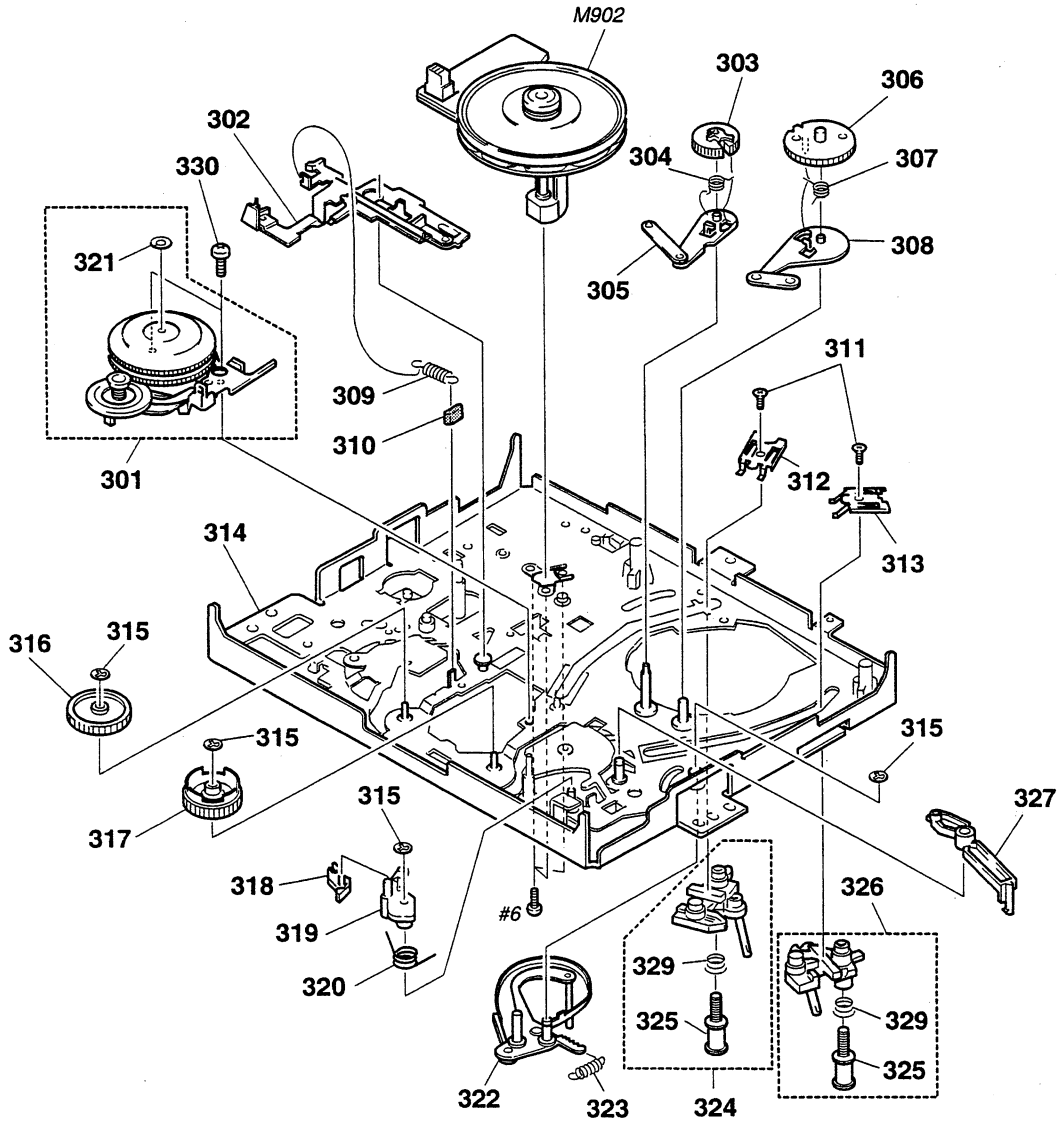
5-1-5. MECHANISM DECK ASSEMBLY-3



Ref. No.	Part No.	Description	Remarks
252	3-959-840-11	RUBBER, JOINT	
253	3-958-159-01	WORM	
254	3-958-460-01	SPRING, ONE-WAY	
255	3-958-160-01	PROPELLOR	
256	3-958-155-01	BEARING, CAM MOTOR	
* 257	X-3943-884-1	CHASSIS ASSY, CAM MOTOR	
258	3-958-157-02	WHEEL, WORM	
259	3-669-595-00	WASHER (2), STOPPER	
260	1-762-076-11	SWITCH, ROTARY	
261	3-958-161-07	GEAR, CAM	

Ref. No.	Part No.	Description	Remarks
262	3-958-156-03	GEAR, FL DRIVING	
263	3-958-445-01	SPRING,TORSIONCOIL(CAP BRAKE)	
264	X-3943-888-1	BRAKE ASSY, CAP	
265	X-3943-889-1	ARM ASSY, TENSION VEHICLE	
266	3-958-361-01	BELT, TIMING	
267	3-958-448-01	WHEEL, TENSION	
* 268	3-959-763-01	RETAINER	
269	3-958-163-04	SLIDER, MAIN	
270	3-958-162-02	GEAR,UPPER/LOWER COMMUNICATION	
M903	X-3943-883-1	MOTOR ASSY, CAM	

5-1-6. MECHANISM DECK ASSEMBLY-4



Ref. No.	Part No.	Description	Remarks
301	A-6739-102-A	RKB BLOCK ASSY	
302	X-3943-897-1	LEVER ASSY, TRIGGER	
303	3-958-485-02	GEAR (T), LOADING	
304	3-960-449-01	SPRING (T), TORSION COIL	
305	X-3943-891-3	LEVER (T) ASSY, LOADING	
306	3-958-476-01	GEAR (S), LOADING	
307	3-960-448-01	SPRING (S), TORSION COIL	
308	X-3943-890-2	LEVER (S) ASSY, LOADING	
309	3-958-529-01	SPRING (MOMENT), TENSION	
310	3-959-840-11	RUBBER, JOINT	
311	3-960-720-01	SCREW	
312	3-960-688-01	SPRING, LEAF (T), LOADING	
313	3-960-687-01	SPRING, LEAF (S), LOADING	
314	X-3945-485-4	CHASSIS ASSY, MECHANICAL	
315	3-669-595-00	WASHER (2), STOPPER	

Ref. No.	Part No.	Description	Remarks
316	3-962-960-01	GEAR (T-K), IDLER	
317	3-962-959-01	GEAR (S-K), IDLER	
318	3-958-533-01	CLAW, S WINDING	
319	3-958-532-01	ARM, S WINDING	
320	3-958-534-01	SPRING, TORSION	
321	3-966-092-01	RING, RETAINING, SLIT WASHER	
322	X-3943-886-1	TG1 ASSY	
323	3-958-492-01	SPRING (TG1), TENSION COIL	
324	A-6750-325-A	T BLOCK ASSY, SHUTTLE	
325	X-3944-378-1	ROLLER ASSY, GUIDE	
326	A-6750-316-A	SHUTTLE (S) BLOCK ASSY	
327	3-958-504-01	ARM, FIXED RELEASE	
329	3-965-178-01	SPRING	
M902	1-698-409-14	MOTOR, DC (CAPSTAN)	

5-2. ELECTRICAL PARTS LIST

Note:

When indicating parts by reference number, please include the board naame.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: μF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... , uPB... , μPB... , uPC... , μPC... , uPD..., μPD...

Ref. No.	Part No.	Description			Remarks
*	A-6791-158-A	DM-63 BOARD, COMPLETE(827MN)			
		**********			
*	A-6791-159-A	DM-63 BOARD, COMPLETE(827AS,827NZ)			
		**********			
*	A-6791-266-A	DM-63 BOARD, COMPLETE(837)			
		**********			
					(Ref.No.:3,000 Series)
*	3-972-809-01	HOLDER, LED (837)			
		< CAPACITOR >			
C440	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (837)
C441	1-163-038-00	CERAMIC CHIP	0.1uF		25V (837)
C442	1-126-933-11	ELECT	100uF	20%	16V (837)
		< CONNECTOR >			
CN440	1-695-947-11	CONNECTOR, BOARD TO BOARD 10P			
CN441	1-774-471-31	CONNECTOR, FFC/FPC 5P(827MN,837)			
		< DIODE >			
D440	8-719-056-07	DIODE SLR-342MC3F(837)			
D441	8-719-056-07	DIODE SLR-342MC3F(837)			
D442	8-719-056-07	DIODE SLR-342MC3F(837)			
D443	8-719-056-07	DIODE SLR-342MC3F(837)			
D444	8-719-056-06	DIODE SLR-342DC3F(837)			
D445	8-719-056-07	DIODE SLR-342MC3F(837)			
D446	8-719-056-07	DIODE SLR-342MC3F(837)			
D447	8-719-056-07	DIODE SLR-342MC3F(837)			
D448	8-719-056-07	DIODE SLR-342MC3F(837)			
D449	8-719-056-06	DIODE SLR-342DCT31(837)			
		< IC >			
IC440	8-759-366-45	IC NJU3713G(TE2) (837)			
		< RESISTOR >			
R440	1-216-073-00	METAL CHIP	10K	5%	1/10W
R441	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R442	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R443	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R444	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R445	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R446	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R447	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R448	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R449	1-216-049-00	METAL CHIP	1K	5%	1/10W (837)
R450	1-216-049-00	METAL CHIP	1K	5%	1/10W (837)
R451	1-216-049-00	METAL CHIP	1K	5%	1/10W (837)
R452	1-216-049-00	METAL CHIP	1K	5%	1/10W (837)
R453	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R454	1-216-033-00	METAL CHIP	220	5%	1/10W (837)
R455	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R456	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R458	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R459	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R460	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (837)
R461	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R462	1-216-073-00	METAL CHIP	10K	5%	1/10W
R463	1-216-073-00	METAL CHIP	10K	5%	1/10W
		< SWITCH >			
S441	1-571-977-11	SWITCH, TACTIL(EJECT)			
S442	1-571-977-11	SWITCH, TACTIL(REW)(827MN,837)			
S443	1-571-977-11	SWITCH, TACTIL(FF) (827MN,837)			
S444	1-571-977-11	SWITCH, TACTIL(PAUSE)			
S445	1-571-977-11	SWITCH, TACTIL(REC)			
S446	1-571-977-11	SWITCH, TACTIL(JOG)(837)			
S447	1-571-977-11	SWITCH, TACTIL(REW)(827AS,827NZ)			
S448	1-571-977-11	SWITCH, TACTIL(FF) (827AS,827NZ)			
S449	1-571-977-11	SWITCH, TACTIL(STOP)(827AS,827NZ)			
S450	1-571-977-11	SWITCH, TACTIL(PLAY)(827AS,827NZ)			

Ref. No.	Part No.	Description			Remarks
*	A-6791-163-A	DM-65 BOARD, COMPLETE(817)			
		**********			
*	A-6791-167-A	DM-65 BOARD, COMPLETE(717)			
		**********			
		(Ref.No.:4,000 Series)			
		< CONNECTOR >			
CN440	1-770-031-11	CONNECTOR, BOARD TO BOARD 7P			
CN441	1-774-471-41	CONNECTOR, FFC/FPC 5P(717)			
		< RESISTOR >			
R441	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R442	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R443	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R444	1-216-295-00	METAL CHIP	0	5%	1/10W
R445	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R446	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R447	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
		< SWITCH >			
S441	1-571-977-11	SWITCH, TACTIL(EJECT)			
S442	1-571-977-11	SWITCH, TACTIL(REW) (717)			
S443	1-571-977-11	SWITCH, TACTIL(FF) (717)			
S444	1-571-977-11	SWITCH, TACTIL(PAUSE)			
S445	1-571-977-11	SWITCH, TACTIL(REC)			
S447	1-571-977-11	SWITCH, TACTIL(REW) (817)			
S448	1-571-977-11	SWITCH, TACTIL(FF) (817)			
S449	1-571-977-11	SWITCH, TACTIL(STOP)(817)			
S450	1-571-977-11	SWITCH, TACTIL(PLAY)(817)			
*	A-6791-155-A	HI-48 BOARD, COMPLETE(837)			
		**********			
*	A-6791-160-A	HI-48 BOARD, COMPLETE(827)			
		**********			
		(Ref.No.:3,000 Series)			
*	3-972-792-01	HOLDER (129), FL (827)			
		< CAPACITOR >			
C412	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C414	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C415	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
* C422	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< CONNECTOR >			
CN400	1-691-036-21	PIN, CONNECTOR (PC BOARD) 4P(837)			
* CN401	1-691-407-11	CONNECTOR, BOARD TO BOARD 10P			
CN402	1-691-074-11	HOUSING, CONNECTOR 15P			
CN403	1-691-074-11	HOUSING, CONNECTOR 15P			
CN404	1-691-074-11	HOUSING, CONNECTOR 15P			
CN405	1-506-484-11	PIN, CONNECTOR 5P			
CN406	1-691-064-31	HOUSING, CONNECTOR 5P			
		< DIODE >			
D410	8-719-108-12	DIODE RD9.1E-W			
D411	8-719-108-12	DIODE RD9.1E-W			
D412	8-719-109-93	DIODE RD6.2ES-B2			
D413	8-719-108-12	DIODE RD9.1E-W			
D420	8-719-110-08	DIODE RD8.2ES-B2			

Ref. No.	Part No.	Description			Remarks
		< JUMPER RESISTOR >			
JR401	1-216-295-00	METAL CHIP	0	5%	1/10W
JR402	1-216-296-00	METAL CHIP	0	5%	1/8W
JR405	1-216-295-00	METAL CHIP	0	5%	1/10W
		< JUMPER RESISTOR >			
JS414	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L412	1-410-521-11	INDUCTOR	100uH (837)		
L413	1-410-501-11	INDUCTOR	2.2uH (837)		
		< FLUORECENT INDICATOR >			
ND400	1-517-594-11	TUBE, FLUORESCENT INDICATOR(837)			
ND400	1-517-594-21	TUBE, FLUORESCENT INDICATOR(827)			
		< JACK >			
PJ400	1-766-861-11	JACK, PIN (3P)(LINE-2 IN) (837)			
PJ401	1-774-509-11	JACK, PIN 3P(LINE-2 IN) (827)			
		< RESISTOR >			
R410	1-216-295-00	METAL CHIP	0	5%	1/10W
R411	1-216-295-00	METAL CHIP	0	5%	1/10W
R412	1-216-022-00	METAL CHIP	75	5%	1/10W
R420	1-216-073-00	METAL CHIP	10K	5%	1/10W (827)
R420	1-216-095-00	METAL CHIP	82K	5%	1/10W (837)
R421	1-216-073-00	METAL CHIP	10K	5%	1/10W (827)
R421	1-216-095-00	METAL CHIP	82K	5%	1/10W (837)
R422	1-216-073-00	METAL CHIP	10K	5%	1/10W
R423	1-216-073-00	METAL CHIP	10K	5%	1/10W
R424	1-216-073-00	METAL CHIP	10K	5%	1/10W
R425	1-216-073-00	METAL CHIP	10K	5%	1/10W
R427	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R430	1-216-089-00	METAL CHIP	47K	5%	1/10W (827)
R431	1-216-075-00	METAL CHIP	12K	5%	1/10W (827)
R432	1-216-075-00	METAL CHIP	12K	5%	1/10W (827)
R433	1-216-061-00	METAL CHIP	3.3K	5%	1/10W (827)
R434	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (827)
R434	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (837)
R435	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (827)
R435	1-216-071-00	METAL CHIP	8.2K	5%	1/10W (837)
		< SWITCH >			
S404	1-571-977-11	SWITCH, TACTIL(COUNTER RESET) (827)			
S405	1-571-977-11	SWITCH, TACTIL(PROGRAM +) (827)			
S406	1-571-977-11	SWITCH, TACTIL(PROGRAM –) (827)			
S407	1-571-977-11	SWITCH, TACTIL(EASY SET UP)			
S408	1-571-977-11	SWITCH, TACTIL(RF CHANNEL) (827)			
S409	1-571-977-11	SWITCH, TACTIL(INPUT SELECT) (827)			
S410	1-571-977-11	SWITCH, TACTIL(RF CHANNEL)			

HI-50 MA-290

Ref. No.	Part No.	Description			Remarks
*	A-6791-164-A	HI-50 BOARD, COMPLETE(817)			
		**********			
*	A-6791-168-A	HI-50 BOARD, COMPLETE(717)			
		**********			
					(Ref.No.:4,000 Series)
*	3-972-815-01	HOLDER (100), FL			
		< CAPACITOR >			
C412	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C414	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
					(817)
C415	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C420	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C421	1-124-589-11	ELECT	47uF	20%	16V
* C422	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< CONNECTOR >			
* CN401	1-691-406-11	CONNECTOR, BOARD TO BOARD 7P			
CN402	1-691-648-11	SOCKET, CONNECTOR 15P			
CN405	1-506-483-21	PIN, CONNECTOR 4P(717)			
CN405	1-506-484-11	PIN, CONNECTOR 5P(817)			
CN406	1-691-064-31	HOUSING, CONNECTOR 5P			
		< DIODE >			
D410	8-719-108-12	DIODE RD9.1E-W			
D411	8-719-108-12	DIODE RD9.1E-W(817)			
D412	8-719-109-93	DIODE RD6.2ES-B2			
D413	8-719-108-12	DIODE RD9.1E-W			
D420	8-719-110-08	DIODE RD8.2ES-B2			
		< IC >			
IC410	8-759-366-44	IC uPD16312GB-3B4			
		< JUMPER RESISTOR >			
JS410	1-216-295-00	METAL CHIP	0	5%	1/10W
					(717)
JS414	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L420	1-410-509-11	INDUCTOR	10uH		
		< FLUORECENT INDICATOR >			
ND400	1-517-668-11	TUBE, FLUORESCENT INDICATOR			
		< JACK >			
PJ401	1-774-509-11	JACK, PIN 3P(LINE-2 IN)(817)			
PJ401	1-774-510-11	JACK, PIN 2P(LINE-2 IN)(717)			
		< RESISTOR >			
R410	1-216-295-00	METAL CHIP	0	5%	1/10W
R411	1-216-295-00	METAL CHIP	0	5%	1/10W
					(817)
R412	1-216-022-00	METAL CHIP	75	5%	1/10W
R420	1-216-295-00	METAL CHIP	0	5%	1/10W
R421	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R422	1-216-049-00	METAL CHIP	1K	5%	1/10W
R423	1-216-049-00	METAL CHIP	1K	5%	1/10W
R424	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R425	1-216-085-00	METAL CHIP	33K	5%	1/10W
R426	1-216-073-00	METAL CHIP	10K	5%	1/10W
R427	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R430	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R431	1-216-295-00	METAL CHIP	0	5%	1/10W
R432	1-216-073-00	METAL CHIP	10K	5%	1/10W
R433	1-216-081-00	METAL CHIP	22K	5%	1/10W
R434	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R435	1-216-073-00	METAL CHIP	10K	5%	1/10W
R436	1-216-081-00	METAL CHIP	22K	5%	1/10W
R438	1-216-073-00	METAL CHIP	10K	5%	1/10W
R439	1-216-073-00	METAL CHIP	10K	5%	1/10W
R440	1-216-073-00	METAL CHIP	10K	5%	1/10W
		< SWITCH >			
S404	1-571-977-11	SWITCH, TACTIL (COUNTER RESET)			
S405	1-571-977-11	SWITCH, TACTIL (PROGRAM +)			
S406	1-571-977-11	SWITCH, TACTIL (PROGRAM –)			
S407	1-571-977-11	SWITCH, TACTIL (COLOR SYSTEM)			
S408	1-571-977-11	SWITCH, TACTIL (RF CHANNEL)			
S409	1-571-977-11	SWITCH, TACTIL (INPUT SELECT)			
S410	1-571-977-11	SWITCH, TACTIL (TAPE SPEED)			

*	A-6791-154-A	MA-290 BOARD, COMPLETE(837ME,837MN)			
		**********			
*	A-6791-157-A	MA-290 BOARD, COMPLETE(837AS)			
		**********			
*	A-6791-162-A	MA-290 BOARD, COMPLETE(827AS)			
		**********			
*	A-6791-178-A	MA-290 BOARD, COMPLETE(827NZ)			
		**********			
*	A-6796-429-A	MA-290 BOARD, COMPLETE(827MN)			
		**********			
					(Ref.No.:3,000 Series)
	1-555-110-00	CABLE, PIN			
*	3-960-273-01	SPACER, TOP END			
*	3-960-274-01	SPACER, LED			
		< BUZZER >			
BZ181	1-529-104-11	BUZZER, PIEZOELECTRIC			
		< CAPACITOR >			
C100	1-126-176-11	ELECT	220uF	20%	10V
C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C103	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C105	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C107	1-130-489-00	MYLAR	0.033uF	5%	50V
C108	1-137-441-11	FILM	0.027uF	5%	50V
C109	1-124-261-00	ELECT	10uF	20%	50V
C130	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C131	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C132	1-124-589-11	ELECT	47uF	20%	16V
C134	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C161	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C162	1-126-935-11	ELECT	470uF	20%	6.3V

Ref. No.	Part No.	Description			Remarks
C163	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C164	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C165	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C166	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C167	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C169	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C181	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C182	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C183	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C184	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C185	1-126-916-11	ELECT	1000uF	20%	6.3V
C186	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C187	1-126-935-11	ELECT	470uF	20%	6.3V
C189	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C190	1-104-905-11	CAPACITOR	0.22F		5.5V
C191	1-126-935-11	ELECT	470uF	20%	6.3V
C192	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C193	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C194	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C195	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C196	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C197	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C201	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C202	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C204	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C205	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C206	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C207	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C208	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C209	1-124-234-00	ELECT	22uF	20%	16V
C210	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C211	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C213	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C214	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C215	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C217	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C219	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C220	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C222	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C223	1-124-589-11	ELECT	47uF	20%	16V
C224	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C226	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C228	1-124-261-00	ELECT	10uF	20%	50V
C229	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C230	1-124-589-11	ELECT	47uF	20%	16V
C231	1-124-261-00	ELECT	10uF	20%	50V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C233	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C234	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C235	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C236	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C237	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C238	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C239	1-124-589-11	ELECT	47uF	20%	16V
C240	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C241	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C242	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C243	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C244	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C245	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C246	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C247	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C248	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C249	1-124-589-11	ELECT	47uF	20%	16V
C250	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C251	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C252	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C253	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C254	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C255	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C301	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C302	1-124-589-11	ELECT	47uF	20%	16V
C305	1-126-160-11	ELECT	1uF	20%	50V
C306	1-126-160-11	ELECT	1uF	20%	50V
C307	1-124-261-00	ELECT	10uF	20%	50V
C308	1-124-589-11	ELECT	47uF	20%	16V
C309	1-126-963-11	ELECT	4.7uF	20%	50V
C310	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C311	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C312	1-137-370-11	FILM	0.01uF	5%	50V
C313	1-124-261-00	ELECT	10uF	20%	50V
C314	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C315	1-126-160-11	ELECT	1uF	20%	50V
C317	1-126-163-11	ELECT	4.7uF	20%	50V
C318	1-124-589-11	ELECT	47uF	20%	16V
C361	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C362	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C363	1-126-160-11	ELECT	1uF	20%	50V
C364	1-126-160-11	ELECT	1uF	20%	50V
C365	1-126-160-11	ELECT	1uF	20%	50V
C366	1-126-160-11	ELECT	1uF	20%	50V
C369	1-126-964-11	ELECT	10uF	20%	50V
C370	1-126-964-11	ELECT	10uF	20%	50V
C371	1-126-964-11	ELECT	10uF	20%	50V
C372	1-126-964-11	ELECT	10uF	20%	50V
C373	1-126-964-11	ELECT	10uF	20%	50V
C374	1-126-160-11	ELECT	1uF	20%	50V
C375	1-137-378-11	FILM	0.22uF	5%	50V
C376	1-137-437-11	FILM	0.0056uF	5%	50V
C377	1-126-967-11	ELECT	47uF	20%	16V
C378	1-126-964-11	ELECT	10uF	20%	50V
C379	1-124-257-00	ELECT	2.2uF	20%	50V
C380	1-126-964-11	ELECT	10uF	20%	50V
C381	1-126-967-11	ELECT	47uF	20%	16V
C382	1-137-437-11	FILM	0.0056uF	5%	50V
C383	1-137-378-11	FILM	0.22uF	5%	50V
C384	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C385	1-126-933-11	ELECT	100uF	20%	16V
C386	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C387	1-126-933-11	ELECT	100uF	20%	16V
C388	1-126-967-11	ELECT	47uF	20%	16V
C389	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C390	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C391	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C392	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C500	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C501	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C502	1-124-589-11	ELECT	47uF	20%	16V
C503	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C504	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V

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Ref. No.	Part No.	Description			Remarks
C505	1-124-589-11	ELECT	47uF	20%	16V
C506	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C507	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C508	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C509	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C510	1-124-589-11	ELECT	47uF	20%	16V
C511	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C512	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C513	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C514	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C515	1-124-589-11	ELECT	47uF	20%	16V
C516	1-126-160-11	ELECT	1uF	20%	50V
C517	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C518	1-124-257-00	ELECT	2.2uF	20%	50V
C519	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C520	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C521	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C522	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C523	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C560	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C561	1-126-935-11	ELECT	470uF	20%	6.3V
C562	1-126-967-11	ELECT	47uF	20%	16V
C563	1-126-967-11	ELECT	47uF	20%	16V
C564	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C573	1-126-160-11	ELECT	1uF	20%	50V
C574	1-126-160-11	ELECT	1uF	20%	50V
C576	1-126-967-11	ELECT	47uF	20%	16V
C577	1-126-160-11	ELECT	1uF	20%	50V
C578	1-126-160-11	ELECT	1uF	20%	50V
C701	1-126-967-11	ELECT	47uF	20%	16V
C702	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C704	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C706	1-126-963-11	ELECT	4.7uF	20%	50V
C707	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C708	1-126-767-11	ELECT	1000uF	20%	16V
C709	1-126-933-11	ELECT	100uF	20%	16V
C710	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C715	1-128-551-11	ELECT	22uF	20%	25V
C731	1-126-964-11	ELECT	10uF	20%	50V
C732	1-126-964-11	ELECT	10uF	20%	50V
C733	1-126-964-11	ELECT	10uF	20%	50V
C740	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C741	1-126-933-11	ELECT	100uF	20%	16V
C742	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C743	1-126-933-11	ELECT	100uF	20%	16V
		< JACK >			
CJ570	1-779-062-11	JACK, PIN 6P(LINE-1 IN/LINE OUT)			
		< CONNECTOR >			
CN101	1-506-470-11	PIN, CONNECTOR 5P			
* CN102	1-766-538-11	CONNECTOR, BOARD TO BOARD 8P			
* CN103	1-766-537-11	CONNECTOR (HMD) 5P			
* CN104	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P			
CN180	1-506-469-11	PIN, CONNECTOR 4P			
CN305	1-573-852-11	CONNECTOR, BOARD TO BOARD 20P			
CN306	1-573-852-11	CONNECTOR, BOARD TO BOARD 20P			
CN420	1-691-074-11	HOUSING, CONNECTOR 15P			
CN421	1-691-074-11	HOUSING, CONNECTOR 15P			
CN422	1-691-074-11	HOUSING, CONNECTOR 15P			

Ref. No.	Part No.	Description	Remarks
CN423	1-506-470-11	PIN, CONNECTOR 5P	
CN600	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
		< DIODE >	
D100	8-719-048-26	DIODE GL528V1	
D107	8-719-911-19	DIODE 1SS119	
D108	8-719-200-82	DIODE 11ES2	
D131	8-719-200-82	DIODE 11ES2	
D161	8-719-200-82	DIODE 11ES2	
D182	8-719-200-82	DIODE 11ES2	
D183	8-719-200-82	DIODE 11ES2	
D361	8-719-911-19	DIODE 1SS119	
D501	8-719-911-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
D503	8-719-911-19	DIODE 1SS119	
D504	8-719-911-19	DIODE 1SS119	
D560	8-719-109-74	DIODE RD4.3ES-B1	
D702	8-719-150-92	DIODE RD33ES-B	
D703	8-719-911-19	DIODE 1SS119	
D740	8-719-911-19	DIODE 1SS119	
D741	8-719-109-85	DIODE RD5.1ES-B2	
		< IC >	
IC106	8-759-702-02	IC NJM062M	
IC130	8-759-353-59	IC LB1643	
IC161	8-752-884-68	IC CXP87852-016Q	
IC181	8-752-882-25	IC CXP82940-017Q	
IC182	8-759-248-87	IC MM1256XF-BE	
IC183	8-759-518-23	IC X24C04S8	
IC201	8-759-464-99	IC LA71511M-MPB(827AS,827NZ)	
IC201	8-759-465-14	IC LA71501M-MPB(827MN,837)	
IC202	8-759-439-50	IC LC89977M-TE-L(827AS,827NZ)	
IC202	8-759-439-51	IC LC89978M-TE-L(827MN,837)	
IC360	8-759-445-22	IC TDA9603H/N2,557	
IC361	8-759-708-05	IC NJM78L05A	
IC500	8-759-446-10	IC MB90089PF-G-179-BND-ER	
IC501	8-759-164-09	IC LA7218M-TE-R	
IC570	8-759-454-62	IC uPC4558G2-E2	
		< JUMPER RESISTOR >	
JS001	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS160	1-216-295-00	METAL CHIP 0 5% 1/10W	(827AS,827NZ)
JS161	1-216-295-00	METAL CHIP 0 5% 1/10W	(827MN,837)
JS202	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS205	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS206	1-216-295-00	METAL CHIP 0 5% 1/10W	(827AS,827NZ)
JS207	1-216-295-00	METAL CHIP 0 5% 1/10W	(827AS,827NZ)
JS208	1-216-295-00	METAL CHIP 0 5% 1/10W	(827MN,837)
JS210	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS501	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS570	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS571	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS572	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS573	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS804	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS805	1-216-295-00	METAL CHIP 0 5% 1/10W	

Ref. No.	Part No.	Description	Remarks
		< COIL >	
L101	1-414-189-31	INDUCTOR 100uH	
L161	1-410-509-11	INDUCTOR 10uH	
L181	1-410-509-11	INDUCTOR 10uH	
L201	1-410-516-11	INDUCTOR 39uH	
L202	1-414-189-31	INDUCTOR 100uH	
L204	1-414-187-11	INDUCTOR 47uH	
L205	1-414-189-31	INDUCTOR 100uH	
L206	1-414-187-11	INDUCTOR 47uH	
L207	1-410-516-11	INDUCTOR 39uH	
L301	1-414-189-31	INDUCTOR 100uH	
L361	1-414-189-31	INDUCTOR 100uH	
L500	1-410-515-11	INDUCTOR 33uH	
L501	1-412-470-21	INDUCTOR 22uH	
L502	1-414-189-31	INDUCTOR 100uH	
L503	1-414-189-31	INDUCTOR 100uH	
L560	1-414-189-31	INDUCTOR 100uH	
L574	1-414-189-31	INDUCTOR 100uH	
L701	1-410-501-11	INDUCTOR 2.2uH	
L702	1-414-187-11	INDUCTOR 47uH	
L704	1-414-179-21	INDUCTOR 2.2uH	
		< PHOTO INTERRUPTER >	
PH100	8-749-010-19	PHOTO INTERRUPTER GP3S113	
PH101	8-749-010-20	PHOTO INTERRUPTER GP3S114	
		< IC LINK >	
⚠PS130	1-533-586-31	LINK, IC	
		< TRANSISTOR >	
Q100	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q101	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q102	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q161	8-729-901-06	TRANSISTOR DTA144EK	
Q201	8-729-010-29	TRANSISTOR MSD601-RST1	
Q202	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q205	8-729-421-19	TRANSISTOR UN2213	
Q206	8-729-421-19	TRANSISTOR UN2213	
Q207	8-729-421-19	TRANSISTOR UN2213	
Q208	8-729-010-29	TRANSISTOR MSD601-RST1	
Q209	8-729-010-05	TRANSISTOR MSB709-RT1	
Q210	8-729-010-29	TRANSISTOR MSD601-RST1	
Q211	8-729-010-29	TRANSISTOR MSD601-RST1	
Q301	8-729-010-29	TRANSISTOR MSD601-RST1	
Q361	8-729-821-31	TRANSISTOR 2SD1012-FG-TPE4	
Q362	8-729-821-31	TRANSISTOR 2SD1012-FG-TPE4	
Q363	8-729-821-31	TRANSISTOR 2SD1012-FG-TPE4	
Q364	8-729-010-05	TRANSISTOR MSB709-RT1	
Q501	8-729-010-29	TRANSISTOR MSD601-RST1	
Q502	8-729-010-05	TRANSISTOR MSB709-RT1	
Q503	8-729-010-05	TRANSISTOR MSB709-RT1	
Q504	8-729-901-06	TRANSISTOR DTA144EK	
Q505	8-729-010-05	TRANSISTOR MSB709-RT1	
Q510	8-729-421-19	TRANSISTOR UN2213	
Q560	8-729-010-05	TRANSISTOR MSB709-RT1	
Q732	8-729-424-67	TRANSISTOR UN2216	
Q733	8-729-424-67	TRANSISTOR UN2216	
Q734	8-729-424-67	TRANSISTOR UN2216	
Q735	8-729-010-05	TRANSISTOR MSB709-RT1	
Q736	8-729-106-68	TRANSISTOR 2SD1615A-GP	

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R100	1-249-400-11	CARBON	39	5%	1/4W F
R101	1-249-400-11	CARBON	39	5%	1/4W F
R102	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R103	1-216-107-00	METAL CHIP	270K	5%	1/10W
R104	1-216-107-00	METAL CHIP	270K	5%	1/10W
R105	1-249-413-11	CARBON	470	5%	1/4W F
R106	1-216-089-00	METAL CHIP	47K	5%	1/10W
R107	1-216-089-00	METAL CHIP	47K	5%	1/10W
R108	1-216-295-00	METAL CHIP	0	5%	1/10W
R109	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R110	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R111	1-216-103-00	METAL CHIP	180K	5%	1/10W
R112	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R113	1-216-073-00	METAL CHIP	10K	5%	1/10W
R114	1-216-073-00	METAL CHIP	10K	5%	1/10W
R115	1-216-089-00	METAL CHIP	47K	5%	1/10W
R116	1-216-089-00	METAL CHIP	47K	5%	1/10W
R117	1-216-089-00	METAL CHIP	47K	5%	1/10W
R118	1-216-089-00	METAL CHIP	47K	5%	1/10W
R119	1-216-295-00	METAL CHIP	0	5%	1/10W
R120	1-216-295-00	METAL CHIP	0	5%	1/10W
R121	1-216-295-00	METAL CHIP	0	5%	1/10W
R122	1-216-295-00	METAL CHIP	0	5%	1/10W
R123	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R124	1-216-049-00	METAL CHIP	1K	5%	1/10W
R125	1-216-049-00	METAL CHIP	1K	5%	1/10W
R126	1-216-025-91	METAL GLAZE	100	5%	1/10W
R127	1-216-025-91	METAL GLAZE	100	5%	1/10W
R128	1-216-049-00	METAL CHIP	1K	5%	1/10W
R130	1-216-089-00	METAL CHIP	47K	5%	1/10W
R131	1-216-081-00	METAL CHIP	22K	5%	1/10W
R132	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R133	1-216-073-00	METAL CHIP	10K	5%	1/10W
R159	1-216-049-00	METAL CHIP	1K	5%	1/10W
R160	1-216-049-00	METAL CHIP	1K	5%	1/10W
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W
R162	1-216-073-00	METAL CHIP	10K	5%	1/10W
R163	1-216-089-00	METAL CHIP	47K	5%	1/10W
R164	1-216-041-00	METAL CHIP	470	5%	1/10W
R165	1-216-041-00	METAL CHIP	470	5%	1/10W
R166	1-216-073-00	METAL CHIP	10K	5%	1/10W
R167	1-216-077-00	METAL CHIP	15K	5%	1/10W
R168	1-216-073-00	METAL CHIP	10K	5%	1/10W
R169	1-216-089-00	METAL CHIP	47K	5%	1/10W
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W
R171	1-216-073-00	METAL CHIP	10K	5%	1/10W
R172	1-216-049-00	METAL CHIP	1K	5%	1/10W
R173	1-216-089-00	METAL CHIP	47K	5%	1/10W
R174	1-216-041-00	METAL CHIP	470	5%	1/10W
R175	1-216-041-00	METAL CHIP	470	5%	1/10W
R176	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R177	1-216-049-00	METAL CHIP	1K	5%	1/10W
R178	1-216-049-00	METAL CHIP	1K	5%	1/10W
R179	1-216-049-00	METAL CHIP	1K	5%	1/10W
R180	1-216-049-00	METAL CHIP	1K	5%	1/10W

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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Ref. No.	Part No.	Description			Remarks
R181	1-216-049-00	METAL CHIP	1K	5%	1/10W
R182	1-216-049-00	METAL CHIP	1K	5%	1/10W
R183	1-216-089-00	METAL CHIP	47K	5%	1/10W
R185	1-216-049-00	METAL CHIP	1K	5%	1/10W
R186	1-216-073-00	METAL CHIP	10K	5%	1/10W
R187	1-216-073-00	METAL CHIP	10K	5%	1/10W
R189	1-216-113-00	METAL CHIP	470K	5%	1/10W
R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
R191	1-216-073-00	METAL CHIP	10K	5%	1/10W
R192	1-216-049-00	METAL CHIP	1K	5%	1/10W
R194	1-216-113-00	METAL CHIP	470K	5%	1/10W
R195	1-216-095-00	METAL CHIP	82K	5%	1/10W
R196	1-216-113-00	METAL CHIP	470K	5%	1/10W
R197	1-216-295-00	METAL CHIP	0	5%	1/10W
R198	1-216-041-00	METAL CHIP	470	5%	1/10W (827,837MN,837ME)
R199	1-216-041-00	METAL CHIP	470	5%	1/10W
R201	1-216-041-00	METAL CHIP	470	5%	1/10W
R202	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R203	1-216-049-00	METAL CHIP	1K	5%	1/10W
R204	1-216-047-91	METAL GLAZE	820	5%	1/10W
R205	1-216-041-00	METAL CHIP	470	5%	1/10W
R206	1-216-041-00	METAL CHIP	470	5%	1/10W
R208	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R209	1-216-295-00	METAL CHIP	0	5%	1/10W
R213	1-216-073-00	METAL CHIP	10K	5%	1/10W
R214	1-216-039-00	METAL CHIP	390	5%	1/10W
R218	1-208-798-11	METAL GLAZE	4.7K	0.50%	1/10W
R219	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R221	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R222	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R223	1-216-295-00	METAL CHIP	0	5%	1/10W
R224	1-216-295-00	METAL CHIP	0	5%	1/10W
R225	1-216-295-00	METAL CHIP	0	5%	1/10W
R226	1-216-295-00	METAL CHIP	0	5%	1/10W
R227	1-216-025-91	METAL GLAZE	100	5%	1/10W
R228	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R229	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R230	1-216-045-00	METAL CHIP	680	5%	1/10W
R231	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R232	1-216-055-00	METAL CHIP	1.8K	5%	1/10W (827MN,837)
R233	1-216-055-00	METAL CHIP	1.8K	5%	1/10W (827AS,827NZ)
R235	1-216-073-00	METAL CHIP	10K	5%	1/10W
R236	1-216-049-00	METAL CHIP	1K	5%	1/10W
R239	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R240	1-216-049-00	METAL CHIP	1K	5%	1/10W
R243	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R244	1-216-089-00	METAL CHIP	47K	5%	1/10W
R248	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R300	1-216-295-00	METAL CHIP	0	5%	1/10W
R301	1-216-093-00	METAL CHIP	68K	5%	1/10W
R302	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R309	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R310	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R311	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R312	1-216-079-00	METAL CHIP	18K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R313	1-216-109-00	METAL CHIP	330K	5%	1/10W
R314	1-216-035-00	METAL CHIP	270	5%	1/10W
R315	1-216-069-00	METAL CHIP	6.8K	5%	1/10W (827AS,827NZ)
R315	1-216-075-00	METAL CHIP	12K	5%	1/10W (827MN,837)
R316	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (827MN,837)
R316	1-216-073-00	METAL CHIP	10K	5%	1/10W (827AS,827NZ)
R318	1-216-075-00	METAL CHIP	12K	5%	1/10W
R319	1-216-295-00	METAL CHIP	0	5%	1/10W
R320	1-216-047-91	METAL GLAZE	820	5%	1/10W
R361	1-216-033-00	METAL CHIP	220	5%	1/10W
R362	1-216-033-00	METAL CHIP	220	5%	1/10W
R363	1-216-033-00	METAL CHIP	220	5%	1/10W
R364	1-216-049-00	METAL CHIP	1K	5%	1/10W
R365	1-216-049-00	METAL CHIP	1K	5%	1/10W
R366	1-216-049-00	METAL CHIP	1K	5%	1/10W
R367	1-216-049-00	METAL CHIP	1K	5%	1/10W
R368	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R369	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R370	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R371	1-208-820-11	METAL GLAZE	39K	0.50%	1/10W
R372	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R373	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R374	1-216-049-00	METAL CHIP	1K	5%	1/10W
R375	1-216-049-00	METAL CHIP	1K	5%	1/10W
R376	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R377	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R378	1-216-083-00	METAL CHIP	27K	5%	1/10W
R379	1-216-073-00	METAL CHIP	10K	5%	1/10W
R380	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R381	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R382	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R383	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R386	1-216-295-00	METAL CHIP	0	5%	1/10W
R387	1-216-295-00	METAL CHIP	0	5%	1/10W
R388	1-216-295-00	METAL CHIP	0	5%	1/10W
R389	1-216-049-00	METAL CHIP	1K	5%	1/10W
R399	1-216-049-00	METAL CHIP	1K	5%	1/10W
R500	1-216-073-00	METAL CHIP	10K	5%	1/10W
R501	1-216-073-00	METAL CHIP	10K	5%	1/10W
R502	1-216-033-00	METAL CHIP	220	5%	1/10W
R505	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R506	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R507	1-216-081-00	METAL CHIP	22K	5%	1/10W
R508	1-216-049-00	METAL CHIP	1K	5%	1/10W
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W
R513	1-216-073-00	METAL CHIP	10K	5%	1/10W
R514	1-216-073-00	METAL CHIP	10K	5%	1/10W
R515	1-216-101-00	METAL CHIP	150K	5%	1/10W
R517	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R518	1-216-043-91	METAL GLAZE	560	5%	1/10W
R519	1-216-043-91	METAL GLAZE	560	5%	1/10W
R520	1-216-025-91	METAL GLAZE	100	5%	1/10W
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W
R522	1-216-073-00	METAL CHIP	10K	5%	1/10W
R523	1-216-073-00	METAL CHIP	10K	5%	1/10W
R560	1-216-022-00	METAL CHIP	75	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R561	1-216-021-00	METAL CHIP	68	5%	1/10W
R562	1-249-407-11	CARBON	150	5%	1/4W F
R563	1-249-408-11	CARBON	180	5%	1/4W F
R565	1-216-037-00	METAL CHIP	330	5%	1/10W
R570	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R571	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R572	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R573	1-216-041-00	METAL CHIP	470	5%	1/10W
R574	1-216-041-00	METAL CHIP	470	5%	1/10W
R577	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R702	1-216-295-00	METAL CHIP	0	5%	1/10W
R705	1-212-893-00	FUSIBLE	330	5%	1/4W F
R706	1-216-113-00	METAL CHIP	470K	5%	1/10W
R709	1-216-295-00	METAL CHIP	0	5%	1/10W
R710	1-216-295-00	METAL CHIP	0	5%	1/10W
R711	1-216-295-00	METAL CHIP	0	5%	1/10W
R712	1-216-295-00	METAL CHIP	0	5%	1/10W
R713	1-216-049-00	METAL CHIP	1K	5%	1/10W
			(827MN,827NZ,837ME,837MN)		
R714	1-216-041-00	METAL CHIP	470	5%	1/10W
R715	1-216-041-00	METAL CHIP	470	5%	1/10W
R716	1-216-041-00	METAL CHIP	470	5%	1/10W
R717	1-216-041-00	METAL CHIP	470	5%	1/10W
R746	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R747	1-216-049-00	METAL CHIP	1K	5%	1/10W
		< MODULATOR >			
RFU700	1-475-059-11	MODULATOR, RF (RFU-2101)			
		< SWITCH >			
S100	1-570-953-11	SWITCH, PUSH (1 KEY)			
		(CASSETTE IN/REC PROOF)			
S160	1-571-308-11	SWITCH, SLIDE(NTSC PB)(827MN,837)			
S160	1-571-588-11	SWITCH, SLIDE(NTSC PB)(827AS,827NZ)			
		< TUNER >			
TU701	1-693-363-11	TUNER, (IF) SOLID TYPE			
		(827MN,837MN,837ME)			
TU701	1-693-367-11	TUNER, (IF) SOLID TYPE(827NZ)			
TU701	1-693-368-11	TUNER, (IF) SOLID TYPE(827AS,837AS)			
		< VIBRATOR >			
X161	1-760-494-11	VIBRATOR, CRYSTAL(16MHz)			
X182	1-579-463-11	VIBRATOR, CRYSTAL(32.768kHz)			
X201	1-579-608-11	VIBRATOR, CRYSTAL(4.433619MHz)			
X202	1-577-380-11	VIBRATOR, CRYSTAL(3.579545MHz)			
		(827MN,837)			
X500	1-577-289-11	VIBRATOR, CRYSTAL(17.734475MHz)			
X501	1-577-165-11	VIBRATOR, CERAMIC			
*	A-6791-166-A	MA-291 BOARD, COMPLETE(817)			
		**********			
*	A-6791-171-A	MA-291 BOARD, COMPLETE(717)			
		**********			
		(Ref.No.:4,000 Series)			
*	3-960-273-01	SPACER, TOP END			
*	3-960-274-01	SPACER, LED			

Ref. No.	Part No.	Description			Remarks
		< CAPACITOR >			
C100	1-126-176-11	ELECT	220uF	20%	10V
C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C103	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C105	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C107	1-130-489-00	MYLAR	0.033uF	5%	50V
C108	1-137-441-11	FILM	0.027uF	5%	50V
C109	1-124-261-00	ELECT	10uF	20%	50V
C110	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C111	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C130	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C131	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C132	1-124-589-11	ELECT	47uF	20%	16V
C134	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C160	1-104-905-11	CAPACITOR	0.22F		5.5V
C162	1-126-933-11	ELECT	100uF	20%	16V
C163	1-126-967-11	ELECT	47uF	20%	16V
C164	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C165	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C166	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C167	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C169	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C170	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C171	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C172	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C175	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C176	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C201	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C202	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C204	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C205	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C206	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C207	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C208	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C209	1-124-234-00	ELECT	22uF	20%	16V
C210	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C211	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C213	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C214	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C215	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C217	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C219	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C220	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C222	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C223	1-124-589-11	ELECT	47uF	20%	16V
C224	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C226	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C228	1-124-261-00	ELECT	10uF	20%	50V
C229	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C230	1-124-589-11	ELECT	47uF	20%	16V
C231	1-124-261-00	ELECT	10uF	20%	50V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C233	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C234	1-164-232-11	CERAMIC CHIP	0.01uF		50V

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Ref. No.	Part No.	Description			Remarks
C235	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C236	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C237	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C238	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C239	1-124-589-11	ELECT	47uF	20%	16V
C240	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C241	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C242	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C243	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C244	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C245	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C246	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C247	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C248	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C249	1-124-589-11	ELECT	47uF	20%	16V
C250	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C251	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C252	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C253	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C255	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C257	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C301	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C302	1-124-589-11	ELECT	47uF	20%	16V
C303	1-126-160-11	ELECT	1uF	20%	50V (717)
C304	1-126-160-11	ELECT	1uF	20%	50V (717)
C305	1-126-160-11	ELECT	1uF	20%	50V
C306	1-126-160-11	ELECT	1uF	20%	50V
C307	1-124-261-00	ELECT	10uF	20%	50V
C308	1-124-589-11	ELECT	47uF	20%	16V
C309	1-126-163-11	ELECT	4.7uF	20%	50V
C310	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C311	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C312	1-137-370-11	FILM	0.01uF	5%	50V
C313	1-124-261-00	ELECT	10uF	20%	50V
C314	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C315	1-126-160-11	ELECT	1uF	20%	50V
C317	1-126-163-11	ELECT	4.7uF	20%	50V
C318	1-124-589-11	ELECT	47uF	20%	16V
C361	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V (817)
C362	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V (817)
C363	1-126-160-11	ELECT	1uF	20%	50V (817)
C364	1-126-160-11	ELECT	1uF	20%	50V (817)
C365	1-126-160-11	ELECT	1uF	20%	50V (817)
C366	1-126-160-11	ELECT	1uF	20%	50V (817)
C369	1-126-964-11	ELECT	10uF	20%	50V (817)
C370	1-126-964-11	ELECT	10uF	20%	50V (817)
C371	1-126-964-11	ELECT	10uF	20%	50V (817)
C372	1-126-964-11	ELECT	10uF	20%	50V (817)
C373	1-126-964-11	ELECT	10uF	20%	50V (817)
C374	1-126-160-11	ELECT	1uF	20%	50V (817)
C375	1-137-378-11	FILM	0.22uF	5%	50V (817)
C376	1-137-437-11	FILM	0.0056uF	5%	50V (817)
C377	1-124-589-11	ELECT	47uF	20%	16V (817)
C378	1-126-964-11	ELECT	10uF	20%	50V (817)
C379	1-124-257-00	ELECT	2.2uF	20%	50V (817)
C380	1-124-261-00	ELECT	10uF	20%	50V (817)
C381	1-126-967-11	ELECT	47uF	20%	16V (817)
C382	1-137-437-11	FILM	0.0056uF	5%	50V (817)
C383	1-137-378-11	FILM	0.22uF	5%	50V (817)
C384	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V (817)
C385	1-126-933-11	ELECT	100uF	20%	16V (817)
C386	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V (817)
C387	1-126-933-11	ELECT	100uF	20%	16V (817)
C388	1-124-589-11	ELECT	47uF	20%	16V (817)
C389	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V (817)
C390	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V (817)
C391	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V (817)
C392	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V (817)
C500	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C501	1-124-589-11	ELECT	47uF	20%	16V
C502	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C503	1-126-160-11	ELECT	1uF	20%	50V
C504	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C505	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C506	1-130-481-00	MYLAR	0.0068uF	5%	50V
C507	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C508	1-137-372-11	FILM	0.022uF	5%	50V
C509	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C511	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C512	1-124-589-11	ELECT	47uF	20%	16V
C513	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C514	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C515	1-124-465-00	ELECT	0.47uF	20%	50V
C516	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C517	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C518	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C560	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C561	1-126-935-11	ELECT	470uF	20%	6.3V
C562	1-126-967-11	ELECT	47uF	20%	16V
C563	1-126-967-11	ELECT	47uF	20%	16V
C564	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C573	1-126-160-11	ELECT	1uF	20%	50V
C574	1-126-160-11	ELECT	1uF	20%	50V (817)
C576	1-126-967-11	ELECT	47uF	20%	16V
C577	1-126-160-11	ELECT	1uF	20%	50V (817)

Ref. No.	Part No.	Description			Remarks
C578	1-126-160-11	ELECT	1uF	20%	50V
C701	1-126-967-11	ELECT	47uF	20%	16V
C702	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C704	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C706	1-126-963-11	ELECT	4.7uF	20%	50V
C707	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C708	1-126-767-11	ELECT	1000uF	20%	16V
C709	1-126-933-11	ELECT	100uF	20%	16V
C710	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C711	1-126-964-11	ELECT	10uF	20%	50V
C740	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C741	1-126-933-11	ELECT	100uF	20%	16V
C742	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C743	1-126-933-11	ELECT	100uF	20%	16V
		< JACK >			
CJ570	1-779-062-11	JACK, PIN 6P(LINE-1 IN/LINE OUT) (817)			
* CJ570	1-779-063-11	JACK, PIN 4P(LINE-1 IN/LINE OUT) (717)			
		< CONNECTOR >			
CN101	1-506-470-11	PIN, CONNECTOR 5P			
* CN102	1-766-538-11	CONNECTOR, BOARD TO BOARD 8P			
* CN103	1-766-537-11	CONNECTOR (HMD) 5P			
* CN104	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P			
CN160	1-506-473-11	PIN, CONNECTOR 8P			
CN305	1-573-852-11	CONNECTOR, BOARD TO BOARD 20P			
CN306	1-573-852-11	CONNECTOR, BOARD TO BOARD 20P			
CN420	1-691-074-11	HOUSING, CONNECTOR 15P			
CN423	1-506-469-11	PIN, CONNECTOR 4P (717)			
CN423	1-506-470-11	PIN, CONNECTOR 5P (817)			
CN600	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P			
		< TRIMMER >			
CT500	1-141-334-11	CAP, TRIMMER 30PF			
		< DIODE >			
D100	8-719-048-26	DIODE GL528V1			
D107	8-719-911-19	DIODE 1SS119			
D108	8-719-200-82	DIODE 11ES2			
D131	8-719-200-82	DIODE 11ES2			
D160	8-719-200-82	DIODE 11ES2			
D161	8-719-200-82	DIODE 11ES2			
D301	8-719-911-19	DIODE 1SS119(717)			
D302	8-719-911-19	DIODE 1SS119(717)			
D361	8-719-911-19	DIODE 1SS119(817)			
D500	8-719-911-19	DIODE 1SS119			
D502	8-719-911-19	DIODE 1SS119			
D503	8-719-911-19	DIODE 1SS119			
D560	8-719-109-74	DIODE RD4.3ES-B1			
D702	8-719-150-92	DIODE RD33ES-B			
D703	8-719-911-19	DIODE 1SS119			
D740	8-719-911-19	DIODE 1SS119			
D741	8-719-109-85	DIODE RD5.1ES-B2			
		< FERRITE BEAD >			
FB701	1-410-397-21	FERRITE BEAD INDUCTOR			

Ref. No.	Part No.	Description			Remarks
		< IC >			
IC106	8-759-702-02	IC NJM062M			
IC130	8-759-353-59	IC LB1643			
IC161	8-752-876-65	IC CXP87860-003Q			
IC162	8-759-248-87	IC MM1256XF-BE			
IC163	8-759-518-23	IC X24C04S8			
IC201	8-759-465-14	IC LA71501M-MPB			
IC202	8-759-439-51	IC LC89978M-TE-L			
IC360	8-759-445-22	IC TDA9603H/N2,557(817)			
IC361	8-759-708-05	IC NJM78L05A (817)			
IC500	8-759-443-81	IC LC74761M-9633-TLM			
IC570	8-759-454-62	IC uPC4558G2			
		< JUMPER RESISTOR >			
JR001	1-216-296-00	METAL CHIP	0	5%	1/8W
JR002	1-216-296-00	METAL CHIP	0	5%	1/8W
JR003	1-216-296-00	METAL CHIP	0	5%	1/8W
JR004	1-216-296-00	METAL CHIP	0	5%	1/8W
JR005	1-216-296-00	METAL CHIP	0	5%	1/8W
JR006	1-216-296-00	METAL CHIP	0	5%	1/8W
JR007	1-216-296-00	METAL CHIP	0	5%	1/8W
JR008	1-216-296-00	METAL CHIP	0	5%	1/8W
JR009	1-216-296-00	METAL CHIP	0	5%	1/8W
JR010	1-216-296-00	METAL CHIP	0	5%	1/8W
JR011	1-216-296-00	METAL CHIP	0	5%	1/8W
JR012	1-216-296-00	METAL CHIP	0	5%	1/8W
JR013	1-216-296-00	METAL CHIP	0	5%	1/8W
JR014	1-216-296-00	METAL CHIP	0	5%	1/8W
JR015	1-216-296-00	METAL CHIP	0	5%	1/8W
JR016	1-216-296-00	METAL CHIP	0	5%	1/8W
JR017	1-216-296-00	METAL CHIP	0	5%	1/8W
JR018	1-216-296-00	METAL CHIP	0	5%	1/8W
JR019	1-216-296-00	METAL CHIP	0	5%	1/8W
JR020	1-216-296-00	METAL CHIP	0	5%	1/8W
JR021	1-216-296-00	METAL CHIP	0	5%	1/8W
JR022	1-216-296-00	METAL CHIP	0	5%	1/8W
JR023	1-216-296-00	METAL CHIP	0	5%	1/8W
JR024	1-216-296-00	METAL CHIP	0	5%	1/8W
JR201	1-216-295-00	METAL CHIP	0	5%	1/10W
JR202	1-216-295-00	METAL CHIP	0	5%	1/10W
JR203	1-216-295-00	METAL CHIP	0	5%	1/10W
JR204	1-216-295-00	METAL CHIP	0	5%	1/10W
JR205	1-216-295-00	METAL CHIP	0	5%	1/10W
JR206	1-216-295-00	METAL CHIP	0	5%	1/10W
JR207	1-216-295-00	METAL CHIP	0	5%	1/10W
JR208	1-216-295-00	METAL CHIP	0	5%	1/10W
JR209	1-216-295-00	METAL CHIP	0	5%	1/10W
JR210	1-216-295-00	METAL CHIP	0	5%	1/10W
JR211	1-216-295-00	METAL CHIP	0	5%	1/10W
JR213	1-216-295-00	METAL CHIP	0	5%	1/10W
JR214	1-216-295-00	METAL CHIP	0	5%	1/10W
JR215	1-216-295-00	METAL CHIP	0	5%	1/10W
JR216	1-216-295-00	METAL CHIP	0	5%	1/10W
JR217	1-216-296-00	METAL CHIP	0	5%	1/8W
		< JUMPER RESISTOR >			
JS210	1-216-295-00	METAL CHIP	0	5%	1/10W

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Ref. No.	Part No.	Description		Remarks
		< COIL >		
L101	1-414-189-31	INDUCTOR	100uH	
L160	1-410-509-11	INDUCTOR	10uH	
L201	1-410-516-11	INDUCTOR	39uH	
L202	1-414-189-31	INDUCTOR	100uH	
L204	1-414-187-11	INDUCTOR	47uH	
L205	1-414-189-31	INDUCTOR	100uH	
L206	1-414-187-11	INDUCTOR	47uH	
L207	1-410-516-11	INDUCTOR	39uH	
L301	1-414-189-31	INDUCTOR	100uH	
L361	1-414-189-31	INDUCTOR	100uH (817)	
L500	1-414-189-31	INDUCTOR	100uH	
L501	1-414-189-31	INDUCTOR	100uH	
L502	1-410-506-11	INDUCTOR	5.6uH	
L503	1-410-513-11	INDUCTOR	22uH	
L560	1-414-189-31	INDUCTOR	100uH	
L574	1-414-189-31	INDUCTOR	100uH	
L701	1-410-501-11	INDUCTOR	2.2uH	
L702	1-414-187-11	INDUCTOR	47uH	
L704	1-410-501-11	INDUCTOR	2.2uH	
L705	1-410-501-11	INDUCTOR	2.2uH	
L706	1-410-501-11	INDUCTOR	2.2uH	
		< PHOTO INTERRUPTER >		
PH100	8-749-010-19	PHOTO INTERRUPTER GP3S113		
PH101	8-749-010-20	PHOTO INTERRUPTER GP3S114		
		< IC LINK >		
⚠PS130	1-533-586-31	LINK, IC		
		< TRANSISTOR >		
Q100	8-729-025-92	PHOTO TRANSISTOR PT380F		
Q101	8-729-025-92	PHOTO TRANSISTOR PT380F		
Q102	8-729-281-53	TRANSISTOR 2SC1815-GR		
Q201	8-729-010-29	TRANSISTOR MSD601-RST1		
Q202	8-729-230-49	TRANSISTOR 2SC2712-YG		
Q205	8-729-421-19	TRANSISTOR UN2213		
Q206	8-729-421-19	TRANSISTOR UN2213		
Q207	8-729-421-19	TRANSISTOR UN2213		
Q208	8-729-010-29	TRANSISTOR MSD601-RST1		
Q209	8-729-010-05	TRANSISTOR MSB709-RT1		
Q210	8-729-010-29	TRANSISTOR MSD601-RST1		
Q211	8-729-010-29	TRANSISTOR MSD601-RST1		
Q212	8-729-010-05	TRANSISTOR MSB709-RT1		
Q213	8-729-010-29	TRANSISTOR MSD601-RST1		
Q301	8-729-010-29	TRANSISTOR MSD601-RST1		
Q302	8-729-424-67	TRANSISTOR UN2216 (717)		
Q361	8-729-821-31	TRANSISTOR 2SD1012-FG-TPE4 (817)		
Q362	8-729-821-31	TRANSISTOR 2SD1012-FG-TPE4 (817)		
Q363	8-729-821-31	TRANSISTOR 2SD1012-FG-TPE4 (817)		
Q364	8-729-010-05	TRANSISTOR MSB709-RT1 (817)		
Q500	8-729-010-05	TRANSISTOR MSB709-RT1		
Q501	8-729-010-05	TRANSISTOR MSB709-RT1		
Q560	8-729-010-05	TRANSISTOR MSB709-RT1		
Q701	8-729-424-67	TRANSISTOR UN2216		
Q702	8-729-010-05	TRANSISTOR MSB709-RT1		
Q740	8-729-106-68	TRANSISTOR 2SD1615A-GP		

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R100	1-249-400-11	CARBON	39	5%	1/4W F
R101	1-249-400-11	CARBON	39	5%	1/4W F
R102	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R103	1-247-889-00	CARBON	270K	5%	1/4W
R104	1-247-889-00	CARBON	270K	5%	1/4W
R105	1-249-413-11	CARBON	470	5%	1/4W F
R106	1-249-437-11	CARBON	47K	5%	1/4W
R107	1-216-089-00	METAL CHIP	47K	5%	1/10W
R108	1-216-295-00	METAL CHIP	0	5%	1/10W
R109	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R110	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R111	1-216-103-00	METAL CHIP	180K	5%	1/10W
R112	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R113	1-216-073-00	METAL CHIP	10K	5%	1/10W
R114	1-216-073-00	METAL CHIP	10K	5%	1/10W
R115	1-216-089-00	METAL CHIP	47K	5%	1/10W
R116	1-216-089-00	METAL CHIP	47K	5%	1/10W
R117	1-216-089-00	METAL CHIP	47K	5%	1/10W
R118	1-216-089-00	METAL CHIP	47K	5%	1/10W
R119	1-216-295-00	METAL CHIP	0	5%	1/10W
R120	1-216-295-00	METAL CHIP	0	5%	1/10W
R121	1-216-295-00	METAL CHIP	0	5%	1/10W
R122	1-216-295-00	METAL CHIP	0	5%	1/10W
R130	1-216-089-00	METAL CHIP	47K	5%	1/10W
R131	1-216-081-00	METAL CHIP	22K	5%	1/10W
R132	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R133	1-216-073-00	METAL CHIP	10K	5%	1/10W
R160	1-249-437-11	CARBON	47K	5%	1/4W
R161	1-249-429-11	CARBON	10K	5%	1/4W
R162	1-216-073-00	METAL CHIP	10K	5%	1/10W
R163	1-249-429-11	CARBON	10K	5%	1/4W
R164	1-249-429-11	CARBON	10K	5%	1/4W
R165	1-249-417-11	CARBON	1K	5%	1/4W F
R166	1-249-421-11	CARBON	2.2K	5%	1/4W F
R167	1-216-089-00	METAL CHIP	47K	5%	1/10W
R168	1-216-073-00	METAL CHIP	10K	5%	1/10W
R169	1-216-077-00	METAL CHIP	15K	5%	1/10W
R170	1-247-891-00	CARBON	330K	5%	1/4W
R171	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R172	1-247-807-31	CARBON	100	5%	1/4W
R173	1-249-419-11	CARBON	1.5K	5%	1/4W F
R174	1-247-807-31	CARBON	100	5%	1/4W
R175	1-216-089-00	METAL CHIP	47K	5%	1/10W
R176	1-216-049-00	METAL CHIP	1K	5%	1/10W
R177	1-216-113-00	METAL CHIP	470K	5%	1/10W
R178	1-216-041-00	METAL CHIP	470	5%	1/10W
R179	1-216-041-00	METAL CHIP	470	5%	1/10W
R180	1-216-073-00	METAL CHIP	10K	5%	1/10W
R181	1-216-073-00	METAL CHIP	10K	5%	1/10W
R184	1-216-073-00	METAL CHIP	10K	5%	1/10W
R185	1-216-049-00	METAL CHIP	1K	5%	1/10W
R186	1-216-041-00	METAL CHIP	470	5%	1/10W
R187	1-216-041-00	METAL CHIP	470	5%	1/10W
R188	1-216-049-00	METAL CHIP	1K	5%	1/10W
R189	1-216-049-00	METAL CHIP	1K	5%	1/10W

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
R190	1-216-049-00	METAL CHIP	1K	5%	1/10W
R201	1-216-041-00	METAL CHIP	470	5%	1/10W
R202	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R203	1-216-049-00	METAL CHIP	1K	5%	1/10W
R204	1-216-047-91	METAL GLAZE	820	5%	1/10W
R205	1-216-041-00	METAL CHIP	470	5%	1/10W
R206	1-216-041-00	METAL CHIP	470	5%	1/10W
R208	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R209	1-216-295-00	METAL CHIP	0	5%	1/10W
R210	1-216-073-00	METAL CHIP	10K	5%	1/10W
R213	1-216-073-00	METAL CHIP	10K	5%	1/10W
R214	1-216-039-00	METAL CHIP	390	5%	1/10W
R218	1-208-798-11	METAL GLAZE	4.7K	0.50%	1/10W
R219	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R221	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R222	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R225	1-216-295-00	METAL CHIP	0	5%	1/10W
R226	1-216-295-00	METAL CHIP	0	5%	1/10W
R227	1-216-025-91	METAL GLAZE	100	5%	1/10W
R228	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R229	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R230	1-216-045-00	METAL CHIP	680	5%	1/10W
R231	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R232	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R235	1-216-073-00	METAL CHIP	10K	5%	1/10W
R236	1-216-049-00	METAL CHIP	1K	5%	1/10W
R239	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R240	1-216-049-00	METAL CHIP	1K	5%	1/10W
R243	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R244	1-216-089-00	METAL CHIP	47K	5%	1/10W
R245	1-216-049-00	METAL CHIP	1K	5%	1/10W
R246	1-216-025-91	METAL GLAZE	100	5%	1/10W
R247	1-216-043-91	METAL GLAZE	560	5%	1/10W
R248	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R301	1-216-091-00	METAL CHIP	56K	5%	1/10W (717)
R301	1-216-093-00	METAL CHIP	68K	5%	1/10W (817)
R302	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R303	1-216-093-00	METAL CHIP	68K	5%	1/10W (717)
R304	1-216-093-00	METAL CHIP	68K	5%	1/10W (717)
R305	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (717)
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R308	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (717)
R309	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	(717)
R309	1-216-067-00	METAL CHIP	5.6K	5% 1/10W	(817)
R310	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R311	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R312	1-216-079-00	METAL CHIP	18K	5%	1/10W
R313	1-216-109-00	METAL CHIP	330K	5%	1/10W
R314	1-216-035-00	METAL CHIP	270	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R315	1-216-075-00	METAL CHIP	12K	5%	1/10W
R316	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R318	1-249-430-11	CARBON	12K	5%	1/4W
R319	1-216-043-91	METAL GLAZE	560	5%	1/10W (717)
R319	1-216-295-00	METAL CHIP	0	5%	1/10W (817)
R320	1-216-047-91	METAL GLAZE	820	5%	1/10W
R361	1-247-815-91	CARBON	220	5%	1/4W (817)
R362	1-216-033-00	METAL CHIP	220	5%	1/10W (817)
R363	1-216-033-00	METAL CHIP	220	5%	1/10W (817)
R364	1-216-049-91	METAL GLAZE	1K	5%	1/10W (817)
R365	1-216-049-00	METAL CHIP	1K	5%	1/10W (817)
R366	1-216-049-91	METAL GLAZE	1K	5%	1/10W (817)
R367	1-249-417-11	CARBON	1K	5%	1/4W F (817)
R368	1-216-133-00	METAL CHIP	3.3M	5%	1/10W (817)
R369	1-216-689-11	METAL CHIP	39K	0.5%	1/10W (817)
R370	1-216-061-00	METAL CHIP	3.3K	5%	1/10W (817)
R371	1-208-820-11	METAL GLAZE	39K	0.50%	1/10W (817)
R372	1-216-061-00	METAL CHIP	3.3K	5%	1/10W (817)
R373	1-216-689-11	METAL CHIP	39K	0.5%	1/10W (817)
R374	1-216-049-00	METAL CHIP	1K	5%	1/10W (817)
R375	1-216-049-00	METAL CHIP	1K	5%	1/10W (817)
R376	1-216-097-91	METAL GLAZE	100K	5%	1/10W (817)
R377	1-216-097-91	METAL GLAZE	100K	5%	1/10W (817)
R378	1-216-083-00	METAL CHIP	27K	5%	1/10W (817)
R379	1-216-073-00	METAL CHIP	10K	5%	1/10W (817)
R380	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (817)
R381	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (817)
R382	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (817)
R383	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (817)
R386	1-216-295-00	METAL CHIP	0	5%	1/10W (817)
R387	1-216-295-00	METAL CHIP	0	5%	1/10W (817)
R388	1-216-295-00	METAL CHIP	0	5%	1/10W (817)
R389	1-216-049-00	METAL CHIP	1K	5%	1/10W (817)
R399	1-216-049-00	METAL CHIP	1K	5%	1/10W (817)
R401	1-216-089-00	METAL CHIP	47K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R420	1-216-399-00	METAL OXIDE	6.8	5%	3W F
R500	1-216-045-00	METAL CHIP	680	5%	1/10W
R501	1-249-421-11	CARBON	2.2K	5%	1/4W F
R502	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R504	1-216-049-00	METAL CHIP	1K	5%	1/10W
R505	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R506	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R507	1-216-049-00	METAL CHIP	1K	5%	1/10W
R508	1-216-049-00	METAL CHIP	1K	5%	1/10W
R509	1-216-295-00	METAL CHIP	0	5%	1/10W
R510	1-216-089-00	METAL CHIP	47K	5%	1/10W
R511	1-216-077-00	METAL CHIP	15K	5%	1/10W
R513	1-216-073-00	METAL CHIP	10K	5%	1/10W
R514	1-216-073-00	METAL CHIP	10K	5%	1/10W
R515	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R516	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R560	1-216-022-00	METAL CHIP	75	5%	1/10W
R561	1-216-021-00	METAL CHIP	68	5%	1/10W
R562	1-249-407-11	CARBON	150	5%	1/4W F
R563	1-249-408-11	CARBON	180	5%	1/4W F
R565	1-249-411-11	CARBON	330	5%	1/4W
R570	1-216-097-91	METAL GLAZE	100K	5%	1/10W (817)
R571	1-216-097-91	METAL GLAZE	100K	5%	1/10W (817)
R572	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R573	1-249-413-11	CARBON	470	5%	1/4W F
R574	1-249-413-11	CARBON	470	5%	1/4W F (817)
R577	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R701	1-216-041-00	METAL CHIP	470	5%	1/10W
R705	1-212-893-00	FUSIBLE	330	5%	1/4W F
R706	1-216-113-00	METAL CHIP	470K	5%	1/10W
R709	1-216-295-00	METAL CHIP	0	5%	1/10W
R710	1-216-295-00	METAL CHIP	0	5%	1/10W
R711	1-216-295-00	METAL CHIP	0	5%	1/10W
R712	1-216-295-00	METAL CHIP	0	5%	1/10W
R714	1-216-041-00	METAL CHIP	470	5%	1/10W
R715	1-216-295-00	METAL CHIP	0	5%	1/10W
R717	1-216-295-00	METAL CHIP	0	5%	1/10W
R718	1-216-295-00	METAL CHIP	0	5%	1/10W
R719	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R746	1-216-049-00	METAL CHIP	1K	5%	1/10W
		< SWITCH >			
S100	1-570-953-11	SWITCH, PUSH (1 KEY) (CASSETTE IN/REC PROOF)			
S160	1-571-308-11	SWITCH, SLIDE(NTSC PB)			
		< TUNER >			
TU701	1-693-371-11	TUNER, MOD/IF SOLID TYPE			
		< VIBRATOR >			
X161	1-760-494-11	VIBRATOR, CRYSTAL 16MHz			
X162	1-579-463-11	VIBRATOR, CRYSTAL 32.768kHz			
X201	1-579-608-11	VIBRATOR, CRYSTAL 4.433619MHz			
X202	1-577-380-11	VIBRATOR, CRYSTAL 3.579545MHz			
X500	1-577-289-11	VIBRATOR, CRYSTAL 17.734475MHz			

Ref. No.	Part No.	Description			Remarks
*	A-6791-265-A	MF-302 BOARD, COMPLETE(827,837)			
		********** (Ref.No.:3,000 Series)			
		< CAPACITOR >			
C401	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
		< CONNECTOR >			
CN407	1-691-064-31	HOUSING, CONNECTOR 5P			
		< DIODE >			
D405	8-719-056-07	DIODE SLR-342MC-A-47			
		< IC >			
IC401	8-749-011-05	IC GP1U28X			
		< TRANSISTOR >			
Q401	8-729-421-22	TRANSISTOR UN2211			
		< RESISTOR >			
R401	1-216-029-00	METAL CHIP	150	5%	1/10W
R402	1-216-295-00	METAL CHIP	0	5%	1/10W
R403	1-216-089-00	METAL CHIP	47K	5%	1/10W
		< SWITCH >			
S403	1-571-977-11	SWITCH, TACTIL(ON/STANDBY)			
*	A-6791-170-A	MF-303 BOARD, COMPLETE(717,817)			
		********** (Ref.No.:4,000 Series)			
		< CAPACITOR >			
C401	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
		< CONNECTOR >			
CN407	1-691-064-31	HOUSING, CONNECTOR 5P			
		< DIODE >			
D405	8-719-056-07	DIODE SLR-342MC-A-47			
		< IC >			
IC401	8-749-011-05	IC GP1U28X			
		< RESISTOR >			
R401	1-216-029-00	METAL CHIP	150	5%	1/10W
R402	1-216-295-00	METAL CHIP	0	5%	1/10W
R403	1-216-089-00	METAL CHIP	47K	5%	1/10W
		< SWITCH >			
S403	1-571-977-11	SWITCH, TACTIL (ON/STANDBY)			

Ref. No.	Part No.	Description			Remarks
*	A-6791-156-A	RP-218 BOARD, COMPLETE(837)			
		**********			
*	A-6791-161-A	RP-218 BOARD, COMPLETE(827)			
		**********			
					(Ref.No.:1,000 Series)
		< CAPACITOR >			
C141	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C142	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C143	1-126-967-11	ELECT	47uF	20%	16V
C144	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C145	1-128-551-11	ELECT	22uF	20%	25V
C147	1-126-933-11	ELECT	100uF	20%	16V
C148	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C149	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C151	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C152	1-124-257-00	ELECT	2.2uF	20%	50V
C153	1-124-257-00	ELECT	2.2uF	20%	50V
C260	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C261	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C264	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C265	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C266	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C267	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C268	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C269	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C270	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C271	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C272	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C273	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C274	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C275	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C276	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C277	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C278	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C279	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C280	1-124-584-00	ELECT	100uF	20%	10V
C281	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C282	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C283	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C284	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C285	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C286	1-124-584-00	ELECT	100uF	20%	10V
C287	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C288	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C289	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C321	1-126-967-11	ELECT	47uF	20%	16V
C322	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C323	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C324	1-104-697-11	FILM	0.047uF	5%	100V (827)
C324	1-137-462-11	FILM	0.018uF	5%	100V (837)
C331	1-126-933-11	ELECT	100uF	20%	16V (837)
C332	1-164-232-11	CERAMIC CHIP	0.01uF		50V (837)
C334	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (837)
C335	1-104-697-11	FILM	0.047uF	5%	100V (837)
C341	1-124-584-00	ELECT	100uF	20%	10V
C342	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C343	1-124-257-00	ELECT	2.2uF	20%	50V
C344	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C345	1-126-160-11	ELECT	1uF	20%	50V
C346	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C347	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C350	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C351	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C352	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C353	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C356	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C357	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C358	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C805	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C809	1-163-033-91	CERAMIC CHIP	0.022uF		50V
		< CONNECTOR >			
CN260	1-766-986-11	CONNECTOR, FFC/FPC 13P			
* CN261	1-564-029-00	PIN, CONNECTOR 4P			
CN262	1-573-834-11	CONNECTOR, BOARD TO BOARD 20P			
CN263	1-573-834-11	CONNECTOR, BOARD TO BOARD 20P			
CN301	1-573-729-11	PIN, CONNECTOR 2P			
CN302	1-506-483-21	PIN, CONNECTOR 4P			
CN303	1-573-729-31	PIN, CONNECTOR 2P			
* CN341	1-564-027-00	PIN, CONNECTOR 2P			
		< IC >			
IC141	8-759-246-14	IC TA8823N			
IC260	8-759-352-17	IC HA118195NT			
IC301	8-759-089-84	IC BA7755AF-T1			
IC340	8-759-055-49	IC AN3327K			
		< JUMPER RESISTOR >			
JR501	1-216-296-00	METAL CHIP	0	5%	1/8W
JR502	1-216-295-00	METAL CHIP	0	5%	1/10W
JR503	1-216-295-00	METAL CHIP	0	5%	1/10W
JR504	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L141	1-414-189-31	INDUCTOR	100uH		
L262	1-414-189-31	INDUCTOR	100uH		
L263	1-414-189-31	INDUCTOR	100uH		
L321	1-414-189-31	INDUCTOR	100uH		
L322	1-414-189-31	INDUCTOR	100uH		
L331	1-410-687-11	INDUCTOR	1.2mH (837)		
L341	1-414-189-31	INDUCTOR	100uH		
L801	1-410-525-11	INDUCTOR	220uH		
L830	1-410-507-11	INDUCTOR	6.8uH		
		< IC LINK >			
⚠PS331	1-533-586-31	LINK, IC			
		< TRANSISTOR >			
Q260	8-729-230-49	TRANSISTOR 2SC2712-YG			
Q321	8-729-802-91	TRANSISTOR 2SD879			
Q331	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q (837)			
Q332	8-729-900-51	TRANSISTOR DTA114TK (837)			

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

RP-218 **RP-220**

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R141	1-216-119-00	METAL CHIP	820K	5%	1/10W
R142	1-216-093-00	METAL CHIP	68K	5%	1/10W
R143	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R144	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R145	1-216-085-00	METAL CHIP	33K	5%	1/10W
R146	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R147	1-216-037-00	METAL CHIP	330	5%	1/10W
R148	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R149	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R260	1-216-045-00	METAL CHIP	680	5%	1/10W
R261	1-216-045-00	METAL CHIP	680	5%	1/10W
R262	1-216-295-00	METAL CHIP	0	5%	1/10W
R263	1-216-295-00	METAL CHIP	0	5%	1/10W
R264	1-216-295-00	METAL CHIP	0	5%	1/10W
R265	1-216-295-00	METAL CHIP	0	5%	1/10W
R266	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R267	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R268	1-216-081-00	METAL CHIP	22K	5%	1/10W
R269	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R270	1-216-081-00	METAL CHIP	22K	5%	1/10W
R271	1-216-049-00	METAL CHIP	1K	5%	1/10W
R272	1-216-081-00	METAL CHIP	22K	5%	1/10W
R273	1-216-081-00	METAL CHIP	22K	5%	1/10W
R274	1-216-075-00	METAL CHIP	12K	5%	1/10W
R275	1-216-075-00	METAL CHIP	12K	5%	1/10W
R276	1-216-049-00	METAL CHIP	1K	5%	1/10W
R317	1-216-079-00	METAL CHIP	18K	5%	1/10W
R321	1-249-401-11	CARBON	47	5%	1/4W F
R322	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W (827)
R322	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (837)
R323	1-217-671-11	METAL CHIP	1	5%	1/10W
R324	1-249-408-11	CARBON	180	5%	1/4W F
R331	1-216-295-00	METAL CHIP	0	5%	1/10W (837)
R332	1-216-083-00	METAL CHIP	27K	5%	1/10W (837)
R333	1-249-394-11	CARBON	12	5%	1/4W F (837)
R336	1-216-164-00	METAL GLAZE	39	5%	1/8W (837)
R336	1-216-296-00	METAL CHIP	0	5%	1/8W (827)
R337	1-216-164-00	METAL GLAZE	39	5%	1/8W (837)
R337	1-216-296-00	METAL CHIP	0	5%	1/8W (827)
R341	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R342	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R343	1-216-073-00	METAL CHIP	10K	5%	1/10W
R344	1-216-079-00	METAL CHIP	18K	5%	1/10W
R345	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R346	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R347	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R350	1-216-033-00	METAL CHIP	220	5%	1/10W
R351	1-216-035-00	METAL CHIP	270	5%	1/10W
R356	1-216-035-00	METAL CHIP	270	5%	1/10W
R357	1-216-097-91	METAL GLAZE	100K	5%	1/10W

Ref. No.	Part No.	Description	Remarks
		< TRANSFORMER >	
T321	1-431-097-11	TRANSFORMER, BIAS OSCILLATION (827)	
T321	1-431-100-11	TRANSFORMER, BIAS OSCILLATION (837)	
T331	1-423-415-11	TRANSFORMER, BIAS OSCILLATION (837)	
*	A-6791-165-A	RP-220 BOARD, COMPLETE (817)	
		**********	
*	A-6791-169-A	RP-220 BOARD, COMPLETE (717)	
		**********	
		(Ref.No.:2,000 Series)	
		< CAPACITOR >	

C140	1-126-160-11	ELECT	1uF	20%	50V
C141	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C142	1-126-160-11	ELECT	1uF	20%	50V
C143	1-126-967-11	ELECT	47uF	20%	16V
C145	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C146	1-126-933-11	ELECT	100uF	20%	16V
C147	1-126-160-11	ELECT	1uF	20%	50V
C149	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C150	1-126-933-11	ELECT	100uF	20%	16V
C260	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C261	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C264	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C265	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C266	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C267	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C268	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C269	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C270	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C271	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C272	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C273	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C274	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C275	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C276	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C277	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C278	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C279	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C280	1-124-584-00	ELECT	100uF	20%	10V
C281	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C282	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C283	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C284	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C285	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C286	1-124-584-00	ELECT	100uF	20%	10V
C287	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C288	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C289	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C321	1-126-967-11	ELECT	47uF	20%	16V
C322	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C323	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C324	1-137-462-11	FILM	0.018uF	5%	100V
C331	1-126-933-11	ELECT	100uF	20%	16V
C332	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C334	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C335	1-104-697-11	FILM	0.047uF	5%	100V

Ref. No.	Part No.	Description			Remarks
C341	1-124-584-00	ELECT	100uF	20%	10V (817)
C342	1-164-232-11	CERAMIC CHIP	0.01uF		50V (817)
C343	1-124-257-00	ELECT	2.2uF	20%	50V (817)
C344	1-163-031-11	CERAMIC CHIP	0.01uF		50V (817)
C345	1-126-160-11	ELECT	1uF	20%	50V (817)
C346	1-163-031-11	CERAMIC CHIP	0.01uF		50V (817)
C347	1-163-031-11	CERAMIC CHIP	0.01uF		50V (817)
C350	1-163-038-00	CERAMIC CHIP	0.1uF	25V	(817)
C351	1-163-135-00	CERAMIC CHIP	560PF	5%	50V (817)
C352	1-163-031-11	CERAMIC CHIP	0.01uF		50V (817)
C353	1-163-038-00	CERAMIC CHIP	0.1uF		25V (817)
C356	1-163-135-00	CERAMIC CHIP	560PF	5%	50V (817)
C357	1-163-031-11	CERAMIC CHIP	0.01uF		50V (817)
C358	1-163-038-00	CERAMIC CHIP	0.1uF		25V (817)
		< CONNECTOR >			
CN260	1-563-585-11	CONNECTOR, FLEXIBLE 8P(717)			
CN260	1-766-986-11	CONNECTOR, FFC/FPC 13P(817)			
* CN261	1-564-029-00	PIN, CONNECTOR 4P			
CN262	1-573-834-11	CONNECTOR, BOARD TO BOARD 20P			
CN263	1-573-834-11	CONNECTOR, BOARD TO BOARD 20P			
CN301	1-573-729-11	PIN, CONNECTOR 2P			
CN302	1-573-733-11	PIN, CONNECTOR 6P			
* CN341	1-564-027-00	PIN, CONNECTOR 2P(817)			
		< IC >			
IC140	8-759-438-83	IC BA6305F			
IC141	8-759-100-93	IC uPC393G2			
IC260	8-759-352-17	IC HA118195NT			
IC301	8-759-089-84	IC BA7755AF-T1			
IC340	8-759-055-49	IC AN3327K(817)			
		< JUMPER RESISTOR >			
JR101	1-216-295-00	METAL CHIP	0	5%	1/10W
JR501	1-216-296-00	METAL CHIP	0	5%	1/8W
JR502	1-216-295-00	METAL CHIP	0	5%	1/10W
JR504	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L140	1-414-189-31	INDUCTOR	100uH		
L260	1-410-509-11	INDUCTOR	10uH		
L261	1-410-509-11	INDUCTOR	10uH		
L262	1-414-189-31	INDUCTOR	100uH		
L263	1-414-189-31	INDUCTOR	100uH		
L321	1-414-189-31	INDUCTOR	100uH		
L322	1-414-189-31	INDUCTOR	100uH		
L331	1-410-687-11	INDUCTOR	1.2mH (817)		
L341	1-414-189-31	INDUCTOR	100uH		

Ref. No.	Part No.	Description			Remarks
		< IC LINK >			
⚠ PS331	1-533-586-31	LINK, IC			
		< TRANSISTOR >			
Q141	8-729-901-06	TRANSISTOR DTA144EK			
Q260	8-729-230-49	TRANSISTOR 2SC2712-G			
Q321	8-729-802-91	TRANSISTOR 2SD879			
Q331	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q			
Q332	8-729-900-51	TRANSISTOR DTA114TK			
		< RESISTOR >			
R140	1-216-117-00	METAL CHIP	680K	5%	1/10W
R141	1-216-037-00	METAL CHIP	330	5%	1/10W
R142	1-216-049-00	METAL CHIP	1K	5%	1/10W
R143	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R144	1-216-043-91	METAL GLAZE	560	5%	1/10W
R145	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R147	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W
R148	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W
R149	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W
R150	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R151	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W
R153	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R155	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R156	1-216-111-91	METAL GLAZE	390K	5%	1/10W
R159	1-216-081-00	METAL CHIP	22K	5%	1/10W
R260	1-216-045-00	METAL CHIP	680	5%	1/10W
R261	1-216-045-00	METAL CHIP	680	5%	1/10W
R262	1-216-295-00	METAL CHIP	0	5%	1/10W
R263	1-216-295-00	METAL CHIP	0	5%	1/10W
R264	1-216-295-00	METAL CHIP	0	5%	1/10W
R265	1-216-295-00	METAL CHIP	0	5%	1/10W
R266	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R267	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R268	1-216-081-00	METAL CHIP	22K	5%	1/10W
R269	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R270	1-216-081-00	METAL CHIP	22K	5%	1/10W
R271	1-216-049-00	METAL CHIP	1K	5%	1/10W
R272	1-216-081-00	METAL CHIP	22K	5%	1/10W
R273	1-216-081-00	METAL CHIP	22K	5%	1/10W
R274	1-216-075-00	METAL CHIP	12K	5%	1/10W
R275	1-216-075-00	METAL CHIP	12K	5%	1/10W
R276	1-216-049-00	METAL CHIP	1K	5%	1/10W
R317	1-216-079-00	METAL CHIP	18K	5%	1/10W
R321	1-249-401-11	CARBON	47	5%	1/4W F
R322	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R323	1-217-671-11	METAL CHIP	1	5%	1/10W
R324	1-249-408-11	CARBON	180	5%	1/4W F
R331	1-216-295-00	METAL CHIP	0	5%	1/10W
R332	1-216-083-00	METAL CHIP	27K	5%	1/10W
R333	1-249-394-11	CARBON	12	5%	1/4W F
R336	1-216-164-00	METAL GLAZE	39	5%	1/8W
R337	1-216-164-00	METAL GLAZE	39	5%	1/8W
R341	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (817)
R342	1-216-051-00	METAL CHIP	1.2K	5%	1/10W (817)
R343	1-216-073-00	METAL CHIP	10K	5%	1/10W (817)

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

RP-220 POWER BLOCK

Ref. No.	Part No.	Description			Remarks
R344	1-216-079-00	METAL CHIP	18K	5%	1/10W (817)
R345	1-216-097-91	METAL GLAZE	100K	5%	1/10W (817)
R346	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (817)
R347	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (817)
R350	1-216-033-00	METAL CHIP	220	5%	1/10W (817)
R351	1-216-035-00	METAL CHIP	270	5%	1/10W (817)
R356	1-216-035-00	METAL CHIP	270	5%	1/10W (817)
R357	1-216-097-91	METAL GLAZE	100K	5%	1/10W (817)
		< TRANSFORMER >			
T321	1-431-100-11	TRANSFORMER, BIAS OSCILLATION			
T331	1-423-415-11	TRANSFORMER, BIAS OSCILLATION			
⚠	1-468-186-11	POWER BLOCK SR802 ********** (EXCEPT 827AS,827NZ,837AS) (Ref.No.:5,000 Series)			
		< CAPACITOR >			
⚠C101	9-902-934-01	FILM	0.1uF	250V	
⚠C102	9-902-934-01	FILM	0.1uF	250V	
⚠C106	9-980-232-01	ELECT	180uF	400V	
C114	1-126-967-11	ELECT	47uF	50V	
C115	1-126-960-11	ELECT	1uF	50V	
C201	1-126-967-11	ELECT	47uF	50V	
C202	1-126-183-11	ELECT	1000uF	16V	
C203	1-126-934-11	ELECT	220uF	16V	
C204	1-126-927-11	ELECT	2200uF	10V	
C205	1-126-925-11	ELECT	470uF	10V	
C206	1-126-967-11	ELECT	47uF	50V	
C207	1-126-925-11	ELECT	470uF	10V	
C208	1-126-960-11	ELECT	1uF	50V	
C301	1-126-934-11	ELECT	220uF	16V	
C302	1-126-933-11	ELECT	100uF	16V	
C303	1-104-667-11	ELECT	22uF	35V	
C304	1-104-668-11	ELECT	33uF	35V	
C305	1-104-667-11	ELECT	22uF	35V	
C306	1-126-925-11	ELECT	470uF	10V	
		< DIODE >			
⚠D101	9-900-511-01	DIODE S1WBA60			
⚠D102	8-719-030-24	DIODE EG01C			
D103	9-900-535-01	DIODE AU02Z			
D104	8-719-118-02	DIODE MA4270			
D105	9-900-535-01	DIODE AU02Z			
D106	8-719-043-74	DIODE AK04			
D107	8-719-043-74	DIODE AK04			
D108	8-719-911-19	DIODE 1SS119			
⚠D201	8-719-030-24	DIODE EG01C			
⚠D202	8-719-510-73	DIODE S3L20U			

Ref. No.	Part No.	Description	Remarks
⚠D204	8-719-027-20	DIODE D3S4M	
⚠D205	8-719-058-08	DIODE RD51FB	
⚠D206	8-719-030-24	DIODE EG01C	
⚠D207	9-900-535-01	DIODE AU02Z	
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-109-85	DIODE RD5.1ES	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-018-83	DIODE D2S4M	
		< FUSE >	
⚠F101	1-532-388-31	FUSE 2A 250V	
		< IC >	
⚠IC101	9-980-235-01	IC AN8028	
		< PHOTOCOUPLER >	
⚠PC101	8-749-924-80	PHOTOCOUPLER PS2561	
		< IC LINK >	
⚠PS201	1-533-592-21	IC LINK 1.6A	
⚠PS203	1-533-593-21	IC LINK 2A	
		< TRANSISTOR >	
⚠Q101	9-980-231-01	TRANSISTOR 2SK1535	
⚠Q301	8-729-113-32	TRANSISTOR 2SB733-K4	
Q302	8-729-422-72	TRANSISTOR UN4211	
⚠Q303	8-729-019-01	TRANSISTOR 2SD2394	
Q305	8-729-119-78	TRANSISTOR 2SC2785	
		< RESISTOR >	
⚠R106	1-244-921-11	CARBON 100k	1/2W
⚠R107	1-244-921-11	CARBON 100k	1/2W
R108	1-260-324-51	CARBON 470	1/2W
R112	1-247-819-11	CARBON 330	1/4W
R116	1-247-837-11	CARBON 1.8k	1/4W
⚠R204	9-980-233-01	FUSE 0.47	1/4W
R313	9-980-234-01	FUSE 2.7	1/4W
⚠	1-468-187-11	POWER BLOCK SR805 ********** (827AS,827NZ,837AS) (Ref.No.:6,000 Series)	
		< CAPACITOR >	
⚠C106	9-980-236-01	ELECT 47uF	400V
C114	1-126-967-11	ELECT 47uF	50V
C115	1-126-960-11	ELECT 1uF	50V
C201	1-126-967-11	ELECT 47uF	50V
C202	1-126-183-11	ELECT 1000uF	16V
C203	1-126-934-11	ELECT 220uF	16V
C204	1-126-927-11	ELECT 2200uF	10V
C205	1-126-925-11	ELECT 470uF	10V
C206	1-126-967-11	ELECT 47uF	50V
C207	1-126-925-11	ELECT 470uF	10V

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description		Remarks
C208	1-126-960-11	ELECT	1uF	50V
C301	1-126-934-11	ELECT	220uF	16V
C302	1-126-933-11	ELECT	100uF	16V
C303	1-104-667-11	ELECT	22uF	35V
C304	1-104-668-11	ELECT	33uF	35V
C305	1-104-667-11	ELECT	22uF	35V
C306	1-126-925-11	ELECT	470uF	10V
		< DIODE >		
⚠D101	9-900-511-01	DIODE S1WBA60		
⚠D102	8-719-030-24	DIODE EG01C		
D103	9-900-535-01	DIODE AU02Z		
D104	8-719-118-02	DIODE MA4270		
D105	9-900-535-01	DIODE AU02Z		
D106	8-719-043-74	DIODE AK04		
D107	8-719-043-74	DIODE AK04		
D108	8-719-911-19	DIODE 1SS119		
⚠D201	9-900-535-01	DIODE AU02Z		
⚠D202	8-719-510-73	DIODE S3L20U		
⚠D204	8-719-027-20	DIODE D3S4M		
⚠D205	8-719-058-08	DIODE RD51FB		
⚠D206	9-900-535-01	DIODE AU02Z		
⚠D207	9-900-535-01	DIODE AU02Z		
D301	8-719-911-19	DIODE 1SS119		
D302	8-719-109-85	DIODE RD5.1ES		
D303	8-719-911-19	DIODE 1SS119		
D304	8-719-018-83	DIODE D2S4M		
		< FUSE >		
⚠F101	1-532-388-31	FUSE 2A 250V		
		< IC >		
⚠IC101	9-980-235-01	IC AN8028		
		< PHOTOCOUPLER >		
⚠PC101	8-749-924-80	PHOTOCOUPLER PS2561		
		< IC LINK >		
⚠PS201	1-533-592-21	IC LINK 1.6A		
⚠PS203	1-533-593-21	IC LINK 2A		
		< TRANSISTOR >		
⚠Q101	9-980-231-01	TRANSISTOR 2SK1535		
⚠Q301	8-729-113-32	TRANSISTOR 2SB733-K4		
Q302	8-729-422-72	TRANSISTOR UN4211		
⚠Q303	8-729-019-01	TRANSISTOR 2SD2394		
Q305	8-729-119-78	TRANSISTOR 2SC2785		
		< RESISTOR >		
⚠R106	1-244-921-11	CARBON	100k	1/2W
⚠R107	1-244-921-11	CARBON	100k	1/2W
R108	1-260-324-51	CARBON	470	1/2W
R112	1-247-819-11	CARBON	330	1/4W
R116	1-247-837-11	CARBON	1.8k	1/4W
⚠R204	9-980-233-01	FUSE	0.47	1/4W
R313	9-980-234-01	FUSE	2.7	1/4W

Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	
		**********	
	1-777-966-11	CABLE, FLAT (FMH-16) 31P(827,837)	
11	1-762-844-21	SWITCH, ROTARY(717,827MN)	
11	1-762-844-31	SWITCH, ROTARY(837)	
⚠15	1-777-851-41	CORD, POWER (717,817,827MN,837MN,837ME	
⚠15	1-777-855-41	CORD, POWER (827,837AS)	
17	1-777-962-12	CABLE, FLAT (FMH-14) 15P(717,817,827MN)	
19	1-777-963-11	CABLE, FLAT (FHM-3) 5P	
34	1-475-008-31	SWITCH BLOCK, CONTROL (837MN,837ME)	
34	1-475-008-41	SWITCH BLOCK, CONTROL (837AS)	
⚠59	1-468-186-11	POWER BLOCK (717,817,827MN,837ME,837MN)	
⚠59	1-468-187-11	POWER BLOCK (827AS,827NZ,837AS)	
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-569-008-11	ADAPTOR, CONVERSION 2P (717ME,717SG,817ME,817SG,827MN,837ME)	
	1-575-334-11	CORD, CONNECTION (FOR VIDEO/AUDIO)1.5m	
	1-696-593-11	CORD, CONNECTION (PAL)(FOR RF) 1.5m	
	3-858-297-11	MANUAL, INSTRUCTION(ENGLISH)(827MN)	
	3-858-297-21	MANUAL, INSTRUCTION(CHINESE)(827MN)	
	3-858-651-11	MANUAL, INSTRUCTION(ENGLISH)(717,818)	
	3-858-651-21	MANUAL, INSTRUCTION(CHINESE)(717PS)	
	3-858-651-31	MANUAL, INSTRUCTION(ARABIC)(717ME)	
	3-858-651-41	MANUAL, INSTRUCTION(PERSIAN)(817SG)	
	3-858-651-51	MANUAL, INSTRUCTION(URDU)(717SG)	
	3-858-651-61	MANUAL, INSTRUCTION(RUSSIAN)(717SG)	
	3-858-668-11	MANUAL, INSTRUCTION(ENGLISH)(827)	
	3-858-669-11	MANUAL, INSTRUCTION(ENGLISH) (837ME,837MN)	
	3-858-669-21	MANUAL, INSTRUCTION(CHINESE)(837MN)	
	3-858-669-31	MANUAL, INSTRUCTION(ARABIC)(837ME)	
	3-858-900-11	MANUAL, INSTRUCTION(ENGLISH)(837AS)	
*	3-972-795-01	CUSHION (717,817,827)	
*	3-972-812-01	CUSHION (837)	
*	3-973-908-01	SPACER	
*	3-974-262-01	INDIVIDUAL CARTON (837MN)	
*	3-974-262-11	INDIVIDUAL CARTON (837ME)	
*	3-974-262-21	INDIVIDUAL CARTON (837AS)	
*	3-974-269-01	INDIVIDUAL CARTON (827MN)	
*	3-974-269-11	INDIVIDUAL CARTON (827NZ)	
*	3-974-269-21	INDIVIDUAL CARTON (827AS)	
*	3-974-269-31	INDIVIDUAL CARTON (817PS)	
*	3-974-269-41	INDIVIDUAL CARTON (817ME)	
*	3-974-269-51	INDIVIDUAL CARTON (817SG)	
*	3-974-269-61	INDIVIDUAL CARTON (717PS)	
*	3-974-269-71	INDIVIDUAL CARTON (717ME)	
*	3-974-269-81	INDIVIDUAL CARTON (717SG)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
		**********	
		HARDWARE LIST	
		**********	
#1	7-682-547-04	SCREW +P 3X6	
#2	7-685-646-79	SCREW (3X8)	
#5	7-624-190-61	STOP RING 2.4, TYPE-CS	
#6	7-628-254-10	SCREW +PS 2.6X6	
#7	7-624-106-04	STOP RING 3.0, TYPE-E	
#8	7-682-645-01	SCREW +PS 3X4	

SECTION 6
INTERFACE, IC PIN FUNCTION DESCRIPTION

6-1. SYSTEM CONTROL — VIDEO BLOCK INTERFACE (MA-290 BOARD IC161)

Signal	Pin No.	I/O	STOP FF/REW	TAPE THREADING	TAPE UNTEREADING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
RF SWP	MA-290 IC161 ①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	MA-290 IC161 ④	O	L	L	L	*2	*3	*3	*3	*3	*3	L	L
$\overline{SP}$	MA-290 IC161 ⑨③	O	*4	*4	*4	*5	*5	*5	*5	*5	*5	*4	*4
V SYNC	MA-290 IC161 ⑨⑥	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
CTL REC	MA-290 IC161 ⑦⑤	O	L	L	L	L	L	L	L	L	L	H	L
NT JUDGE	MA-290 IC161 ⑬	O	L	L	L	L	L	L	L	L	L	L	L

*1. 25 Hz (PAL)/30 Hz (NTSC) 50% duty pulse synchronizing with drum rotation.
*2. Normally "L"."H" when the video signal is not detected.
*3. V period "H" pulse.
*4. Selected by REC mode, "L" in the SP mode.
*5. Selected according to the tape recording mdoe.
*6. Composite Sync signal (positive).

6-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-290 BOARD IC161)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTEREADING	PB	PB • PAUSE	SLOW	CUE	×2	REVIEW	REC	REC • PAUSE	PB INDEX WRT/ERS
REC CTL	MA-290 IC161 ⑦	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	
$\overline{CAP\ STOP}$	MA-290 IC161 ③⑤	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	MA-290 IC161 ⑨⑨	O	L	L	L	L	L	L	L	*2	L	L	L	L	L	
CTL REC	MA-290 IC161 ⑦⑤	O	L	L	L	L	L	L	L	L	L	L	L	H	L	H
CTL-INDEX	MA-290 IC161 ⑦⑨	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
$\overline{PB\ CTL}$	MA-290 IC161 ⑥⑦	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
DRUM PG	MA-290 IC161 ⑥⑧	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7	
DRUM FG	MA-290 IC161 ⑥⑨	I	*4	*8	*8	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8	
CAP FG	MA-290 IC161 ⑦⑩	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L	
CAP DA	MA-290 IC161 ⑦③	O	*10	*10	*10	*10	*10	*11	*10	*10	*11	*11	*11	*11	*10	
DRUM DA	MA-290 IC161 ⑦④	O	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	
CTL STEP	MA-290 IC161 ⑦⑥	O	L	L	L	L	L	L	L	*13	L	L	L	L	L	

*1. 30 Hz or 25 Hz pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stop.
*5. Unstable period pulse.
*6. Pulse of period in proportion to tape speed.
*7. 30 Hz or 25 Hz pulse.
*8. 360 Hz or 300 Hz or 180/150 Hz pulse.
*9. Pulse at tape running.
*10. Approx. 2 msec period "H" or "L" pulse.
*11. Approx. 1.5 msec period "H" or "L" pulse.
*12. Approx. 3 msec period "H" or "L" pulse.
*13. "H" when FWD direction STEP drive.

6-3. SYSTEM CONTROL — MECHANISM INTERFACE (MA-290 BOARD IC161)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
CAM 2	MA-290 IC161 ⑨	O	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L
CAM 1	MA-290 IC161 ⑩	O	L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L
MODE 1	MA-290 IC161 ㉒	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2	MA-290 IC161 ㉑	I	L	L	L	*1	*1	L	L	L	H	H	H	H	H	H	H	H
MODE 3	MA-290 IC161 ⑳	I	L	L	L	*1	*1	H	H	H	L	H	H	L	L	H	L	H
MODE 4	MA-290 IC161 ⑲	I	L	H	H	*1	*1	H	L	L	L	L	L	L	L	L	L	L
C IN (REC PRF)	MA-290 IC161 ⑮	I	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
TREEL FG	MA-290 IC161 ⑭	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
SREEL FG	MA-290 IC161 ⑬	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	MA-290 IC161 ㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
$\overline{\text{CAP STOP}}$	MA-290 IC161 ㉟	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	MA-290 IC161 ㉞	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
CAP DA	MA-290 IC161 ㉝	O																
T SENS	MA-290 IC161 ⑥①	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	MA-290 IC161 ⑥②	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainty.
*2. "L" when erasing protection tab is bent, "H" when not bent.
*3. Pause of period in proportionate to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse in tape running.
*6. Normally "L" . 2 msec period "H" pulse when tape top or tape end is detected.

6-4. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-290 BOARD IC161)

Signal	Pin No.	I/O	I/O level
$\overline{\text{ASURA RESET}}$	MA-290 IC161 ㊵	I	Normally "H", "L" when service interruption is detected or restored.
$\overline{\text{ASURA CS}}$	MA-290 IC161 ㊹	I	Chip select signal from the timer microprocessor. V period "L" pulse.
S IN 0	MA-290 IC161 ㊺	I	Serial communication data from the timer microprocessor. V period "L" pulse.
S OUT 0	MA-290 IC161 ㊻	O	Serial communication data to the timer microprocessor. V period "L" pulse.
$\overline{\text{S CLK}}$	MA-290 IC161 ㊼	I	Serial communication clock with the timer microprocessor. V period "L" pulse.

6-5. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-290 BOARD IC161)

Signal	Pin No.	I/O	STOP FF/REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
AF ENV	MA-290 IC161 ㊾	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	MA-290 IC161 ㉛	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
AF REC $\overline{\text{P}}$	MA-290 IC161 ②	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	MA-290 IC161 ⑩⓪	O	*1	L	L	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERS}}$	MA-290 IC161 ㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 25 Hz (PAL)/30 Hz (NTSC) 50 % duty pulse approximatery 5 msec. delayed from RF SW P.

6-6. SYSTEM CONTROL — VIDEO BLOCK INTERFACE (MA-291 BOARD IC161)

Signal	Pin No.	I/O	STOP FF/REW	TAPE THREADING	TAPE UNTHREADING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
RF SW	MA-291 IC161 ①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	MA-291 IC161 ④	O	L	L	L	*2	*3	*3	*3	*3	*3	L	L
$\overline{\text{SP}}$	MA-291 IC161 ⑨③	O	*4	*4	*4	*5	*5	*5	*5	*5	*5	*8	*8
V SYNC	MA-291 IC161 ⑥⑥	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
NT JUDGE	MA-291 IC161 ⑬	O	L	L	L	L	L	L	L	L	L	L	L

*1. 25 Hz (PAL)/30 Hz (NTSC) 50 % duty pulse synchrozing with drum rotation.
*2. Normally "L"."H" when the video signal is not detected.
*3. V period "H" pulse.
*4. Selected by REC mode. "L" in the SP mode.
*5. Selected according to the tape recording mode.
*6. Composite Sync signal (positive).

6-7. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-291 BOARD IC161)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTEREADING	PB	PB • PAUSE	SLOW	CUE	×2	REVIEW	REC	REC • PAUSE
REC CTL	MA-291 IC161 ⑦	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{CAP STOP}}$	MA-291 IC161 ㉞	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)
STEP PLS	MA-291 IC161 ㊾	O	L	L	L	L	L	L	L	*2	L	L	L	L	L
$\overline{\text{PB CTL}}$	MA-291 IC161 ㊼	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H
DRUM PG	MA-291 IC161 ㊽	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7
DRUM FG	MA-291 IC161 ㊾	I	*4	*8	*8	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8
CAP FG	MA-291 IC161 ㊿	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L
CAP DA	MA-291 IC161 ㊸	O	*10	*10	*10	*10	*10	*11	*10	*10	*11	*11	*11	*11	*10
DRUM DA	MA-291 IC161 ㊹	O	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12
CTL RESET	MA-291 IC161 ⑩	O	*13	*6	*6	*13	*13	*1	*13	*14	*6	*6	*6	*1	*13

*1. 30 Hz or 25 Hz pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stop.
*5. Unstable period pulse.
*6. Pulse of period in proportion to tape speed.
*7. 30 Hz or 25 Hz pulse.
*8. 360 Hz or 300 Hz or 180/150 Hz pulse.
*9. Pulse at tape running.
*10. Approx. 2 msec period "H" or "L" pulse.
*11. Approx. 1.5 msec period "H" or "L" pulse.
*12. Approx. 3 msec period "H" or "L" pulse.
*13. Approx. 2.5 V.
*14. "L" only during FWD slow.

6-8. SYSTEM CONTROL — MECHANISM INTERFACE (MA-291 BOARD IC161)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
CAM 2	MA-291 IC161 ⑨	O	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L
CAM 1	MA-291 IC161 ⑧	O	L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L
MODE 1	MA-291 IC161 ㉒	I	H	L	L	*8	*8	H	H	H	H	H	H	H	H	L	H	H
MODE 2	MA-291 IC161 ㉑	I	L	L	L	*8	*8	L	L	L	H	H	H	H	H	H	H	H
MODE 3	MA-291 IC161 ⑳	I	L	L	L	*8	*8	H	H	H	L	H	H	L	L	H	L	H
MODE 4	MA-291 IC161 ⑲	I	L	H	H	*8	*8	H	L	L	L	L	L	L	L	L	L	L
C IN (REC PRF)	MA-291 IC161 ⑰	I	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
TREEL FG	MA-291 IC161 ⑭	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
SREEL FG	MA-291 IC161 ⑬	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	MA-291 IC161 ㉟	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
$\overline{\text{CAP STOP}}$	MA-291 IC161 ㉞	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	MA-291 IC161 ⑫	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
CAP DA	MA-291 IC161 ⑬	O																
T SENS	MA-291 IC161 ⑥	I	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
S SENS	MA-291 IC161 ⑫	I	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7

*1. "H" when mechanism mode transition.
*2. "L" when erasing protection tab is bent, "H" when not bent.
*3. Pause of period in proportion to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse at tape running.
*6. "L" when tape running and CAP RVS is "H".
*7. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.
*8. Uncertainty.

6-9. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-291 BOARD IC161)

Signal	Pin No.	I/O	I/O level
$\overline{\text{ASURA RESET}}$	MA-291 IC161 ㊵	I	Normally "H", "L" when service interruption is detected or restored.
S IN 0	MA-291 IC161 ㊺	I	Serial communication data from the timer microprocessor. V period "L" pulse.
S OUT 0	MA-291 IC161 ㊻	O	Serial communication data to timer microprocessor. V period "L" pulse.
S CLK	MA-291 IC161 ㊼	O	Serial communication clock with timer microprocessor. V period "L" pulse.

6-10. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-291 BOARD IC161)

Signal	Pin No.	I/O	STOP FF/REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
AF ENV	MA-291 IC161 ㊽	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	MA-291 IC161 ⑮	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
AF REC $\overline{\text{P}}$	MA-291 IC161 ②	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	MA-291 IC161 ⑩⓪	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERS}}$	MA-291 IC161 ㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 30 Hz 50 % duty pulse Approx. 5 msec. delayed from RF SW P.

6-11. SYSTEM CONTROL MICROPROCESSOR (MA-290 BOARD IC161)

Pin.No.	Signal	I/O	Function
1	RF_SWP	O	RF switching pulse
2	AF_REC_P	O	Hi-Fi record pulses
3	NC	O	
4	QVD	O	Syeudo VD
5	NC	O	
6	NC	O	
7	REC_CTL	O	REC CTL output
8	NC CTL RESET		
9	CAM 1	O	CAM motor control 1
10	CAM 2	O	CAM motor control 2
11	TA MUTE	O	Tuner audio mute
12	NC		(Low)
13	NT_JUDGE	I	NTSC judgement in (3.58/4.43)
14	MESECAM	I	MESECAM judgement in
15	CIN (REC PRF)	I	Cassette in & safety tab detection input
16	NC (RENTAL)		
17	NC		
18	NC		
19	MODE 4	I	Capstain data 4
20	MODE 3	I	Capstain data 3
21	MODE 2	I	Capstain data 2
22	MODE 1	I	Capstain data 1
23	NC	O	
24	NC	O	
25	NC	O	
26	NC	O	
27	NC	O	
28	SDA 0	O	IIC data line (VIDEO, Hi-Fi)
29	NC	O	
30	SCL 0	O	IIC clock line (VIDEO, Hi-Fi)
31	AMUTE	O	Audio mute
32	T/E LED	O	Top end LED ON/OFF control
33		O	
34		O	
35	CAP STOP	O	Capstain motor stop control
36	FULL ERASE	O	Full erase head control
37	NC	O	
38	NC	O	
39	MP	I	
40	$\overline{\text{ASURA RESET}}$	I	Fixed to "L"
41	VSS	—	System reset signal
42	XTAL	—	Ground
43	EXTAL	—	System clock 16MHz
44	$\overline{\text{ASAURA CS}}$	I	System clock 16MHz
45	S IN 0	I	Servo/system control microcomputer chip select signal
46	S OUT 0	O	Serial communication signal
47	$\overline{\text{SCLK}}$	O	Serial communication signal
48	NC	I/O	Serial communication signal
49	F MONO	I/O	Compulsory mono
50	NC	I/O	

Pin.No.	Signal	I/O	Function
51	NC	I/O	
52	AVSS	—	Unswitched ground
53	AVREF	—	A/D port reference input UNSW 5V
54	AVDD	—	UNSW 5V
55	NT_PB_SW	I	NTSC playback switch in
56	VA ADJ	I	Hi-Fi/RF switching adjustment mode
57	NC CM FREE A	I	
58	NC CM FREE V	I	
59	AF ENV	I	AF envelope level input
60	RF ENV	I	RF envelope level inout
61	T SENS	I	Take up sensor input
62	S SENS	I	Supply sensor input
63	S REEL FG	I	Supply reel FG input
64	T REEL FG	I	Take up reel FG input
65	NC	I	NC
66	V SYNC	I	V sync input
67	$\overline{\text{PB CTL}}$	I	Playback CTL input
68	DRM PG	I	Drum PG input
69	DRM FG	I	Drum FG input
70	CAP FG	I	Capstain FG input
71	SECAM MIX	O	Color display for SECAM system during menu superposition display
72	CAP RVS	O	Capstain motor forward/reverse control
73	CAP DA	O	Capstain motor rotating control D/A output
74	DRM DA	O	Drum motor rotating contral D/A output
75	CTL REC	O	CTL amp REC prohibited
76	CTL STEP	O	CTL amp step control (Hi)
77	REC COUNT	I	Record count input
78	CLK	I	(Hi)
79	CTL INDEX	O	CTL index control
80	SO 1	O	SSB serial data out
81	SCK 1	O	SSB serial clock out
82	NC		
83	NC		
84	CAP TRQ PWM	O	Capstain TRQ PWM output
85	NC		
86	NC	—	
87	NC	—	
88	VSS	—	Ground
89	VDD	—	5V
90	NC	—	
91	NC	O	
92	NC	O	
93	$\overline{\text{SP}}$	O	SP
94	NC	O	
95	NC	O	
96	AF REC	O	Hi-Fi record control
97	NC	O	
98	NC	O	
99	STEP_PLS	O	Capstain driving control pulse output
100	AF_SWP	O	Hi-Fi switching pulse

6-12. MODE CONTROL MICROPROCESSOR (MA-290 BOARD IC181)

Pin.No.	Signal	I/O	Function
1	NC	I	
2	POWER FAIL	I	Power file detection
3	H DET	I	H sync detection input
4	SIRCS IN	I	RMC in (AV-BUS, MF)
5	STEREO_DET	I	Stereo detection
6	SW 1	O	BG/DK
7	BUZZER	O	Buzzer output
8	(NC) G + VSEL	O	Guide plus select
9	(NC) G + RESET	O	Guide plus reset
10	SCK 0	O	Serial 0 clock (OSD IC, S/S, VSET, LED CHIP)
11	SI 0	I	Serial 0 input data (S/S, VSET)
12	SO 0	O	Serial 0 output data (OSD IC, S/S, VSET, LED CHIP)
13	(NC) BUSY	I	Guide plus busy line
14	LANC INPUT	I	LANC input
15	LANC_OUT	O	LANC output
16	A/D 0	I	Key input
17	A/D 1	I	Key input
18	A/D 2	I	Key input
19	A/D 3	I	Key input
20	A/D 4	I	Key input
21	A/D 5	I	Key input
22	NC	I	
23	AFT	I	AFT input
24	AVDD	—	UNSWD 5V
25	AV REF	—	A/D port reference input UNSW 5V
26	SCL	O	IIC clock (TUNER, EEPROM)
27	CG_CS	O	OSD chip select
28	SDA 0	O	IIC data (TUNER, EEPROM)
29	LED_CS	O	LED ship select
30	AVSS	—	Unswitched ground
31	EXTAL	—	System clock
32	XTAL	—	System clock
33	VSS	—	Ground
34	$\overline{RST}$	I	Reset signal in
35	PLL_CLK	O	Tuner PLL clock
36	PLL_DATA	O	Tuner PLL data
37	PLL_ENABL	O	Tuner PLL enable
38	NC	O	NC
39	NC	I	NC

Pin.No.	Signal	I/O	Function
40	NC	O	NC
41	DMS 1	I	DMS 1 input
42	DMS 2	I	DMS 2 input
44	SEG 1	O	FLD segment
45	SEG 2	O	FLD segment
46	SEG 3	O	FLD segment
47	SEG 4	O	FLD segment
48	SEG 5	O	FLD segment
49	SEG 6	O	FLD segment
50	SEG 7	O	FLD segment
51	SEG 8	O	FLD segment
52	SEG 9		LCD segment output
53	SEG 10		LCD segment output
54	SEG 11		LCD segment output
55	SEG 12		LCD segment output
56	SEG 13		LCD segment output
57	SEG 14		LCD segment output
58	SEG 15		LCD segment output
59	SEG 16		LCD segment output
60	SEG 17		LCD segment output
61	SEG 18		LCD segment output
62	SEG 19		LCD segment output
63	NC	—	
64	NC	—	
65	NC	—	
66	GRID 6	O	LCD grid signal
67	GRID 5		LCD grid signal
68	GRID 4		LCD grid signal
69	GRID 3		LCD grid signal
70	GRID 2		LCD grid signal
71	GRID 1		LCD grid signal
72	VDD		UNSWD 5V
73	TX	—	Connected to oscillator for clock
74	TEX	—	Connected to oscillator for clock
75	NC/VPP	—	Connected to +5V
76	ASURE_CS	O	ASURE (S/S) chip select
77	SYS RESET	O	System reset
78	POWER CONT 1	O	Power ON/OFF control 1
79	POWER CONT 2	O	Power ON/OFF control 2
80	CGV	I	OSD IC vsync in

6-13. SYSTEM CONTROL MICROPROCESSOR (MA-291 BOARD IC161)

Pin.No.	Signal	I/O	Function
1	RF_SWP	O	RF switching pulse
2	AF_REC_P	O	Hi-Fi record pulses
3	SYS_RESET	O	System reset control
4	QVD	O	Syeudo VD
5	NC	O	
6	SYS CHECK	O	System check
7	REC_CTL	O	REC CTL output
8	CAM 1	O	CAM motor control 1
9	CAM 2	O	CAM motor control 2
10	CTL REDET	O	CTL reset
11	TA MUTE	O	Tuner audio mute
12	MOD G_/K	I	TV system modulation choice in
13	NT_JUDGE	I	NTSC judgement in (3.58/4.43)
14	MESECAM	I	MESECAM judgement in
15	A MUTE	O	Audio mute
16	NC		
17	CIN (REC PRF)	I	Cassette in & safety tab detection input
18	NC		
19	MODE 4	I	Capstain data 4
20	MODE 3	I	Capstain data 3
21	MODE 2	I	Capstain data 2
22	MODE 1	I	Capatain data 1
23	BG_/DK	O	BG/DK system choice out
24	PLL CLOCK	O	Tuner PLL clock
25	PLL DATA	O	Tuner PLL data
26	PLL ENABLE	O	Tuner PLL enable signal
27	NC	O	
28	SDA 0	O	IIC data line (VIDEO, Hi-Fi, TUNER, EEPROM)
29	NC	O	
30	SCL 0	O	IIC clock line (VIDEO, Hi-Fi, TUNER, EEPROM)
31	NC	O	
32	NC	O	
33	OSD_CS	O	OSD chip select
34	CAP_STOP	O	Capstain motor stop
35	T/E LED	O	Top end sensor LED ON/OFF control
36	FULL ERASE	O	Full erase head control
37	NC	O	
38	NC	O	
39	MP	I	Fixed to "L"
40	$\overline{\text{ASURA RESET}}$	I	System reset signal
41	VSS	—	Ground
42	XTAL	—	System clock 16MHz
43	EXTAL	—	System clock 16MHz
44	$\overline{\text{ASURA CS}}$	I	Servo/system control microcomputer chip select signal
45	S IN 0	I	Serial communication signal
46	S OUT 0	O	Serial communication signal
47	$\overline{\text{SCLK}}$	O	Serial communication signal
48	NTPB SW	I/O	NTSC playback switch in
49	AFT	I/O	AFT input
50	AV_ADJ	I/O	Adjustment/test mode in

Pin.No.	Signal	I/O	Function
51	NC	I/O	
52	AVSS	—	Unswitched ground
53	AVREF	—	A/D port reference input UNSW 5V
54	AVDD	—	UNSW 5V
55	DMS 1	I	DMS 1 in
56	DMS 2	I	DMS 2 in
57	FUNC 1	I	Function key 1 in
58	FUNC 2	I	Function key 2 in
59	AF ENV	I	AF envelope level input
60	RF ENV	I	RF envelope level input
61	T SENS	I	Take up sensor input
62	S SENS	I	Supply sensor input
63	S REEL FG	I	Supply reel FG input
64	T REEL FG	I	Take up reel FG input
65	H DET	I	H sync detection input
66	V SYNC	I	V sync input
67	PB CTL	I	Playback CTL input
68	DRUM PG	I	Drum PG input
69	DRM FG	I	Drum FG input
70	CAP FG	I	Capstain FG input
71	NC	O	
72	CAP RVS	O	Capstain motor forward/reverse control
73	CAP DA	O	Capstain motor rotating control D/A output
74	DRM DA	O	Drum motor rotating control D/A output
75	NC	O	
76	NC	O	
77	REC COUNT	I	Record count input
78	NC	I	
79	NC (EEP BUSY)	O	EEPROM busy
80	SO 1	O	SSB serial data out
81	SCK 1	O	SSB serial clock out
82	POWER FAIL	I	Power file detection input
83	NC		
84	CAP TRQ PWM	O	Capstain TRQ PWM output
85	RMC	I	Remote control receiving signal input
86	TEX	—	System clock 32.768kHz
87	TEX	—	System clock 32.768kHz
88	VSS	—	Ground
89	VDD	—	5V
90	5V	—	5V
91	NC	O	
92	CTL GAIN HIGH	O	CTL gain high control (NC)
93	SP	O	SP
94	NC	O	
95	NC	O	
96	AF REC	O	Hi-Fi record control
97	POWER CONT	O	Power ON/OFF control
98	FL_CS	O	FDP driver chip select
99	STEP_PLS	O	Capstain driving control pulse output
100	AF_SWP	O	Hi-Fi switching pulse

SECTION 7
ADJUSTMENTS

7-1 MECHANICAL ADJUSTMENTS

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL Ⅳ (H MECHANISM)" (9-973-623-11).

7-2. ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 7-8 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth of 30MHz or more, with delay mode (A probe 10:1 should be used unless otherwise specified.)
3) Frequency counter
4) Pattern generator
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Alignment tapes
    KRV-51P Part No. : 8-192-605-36

2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

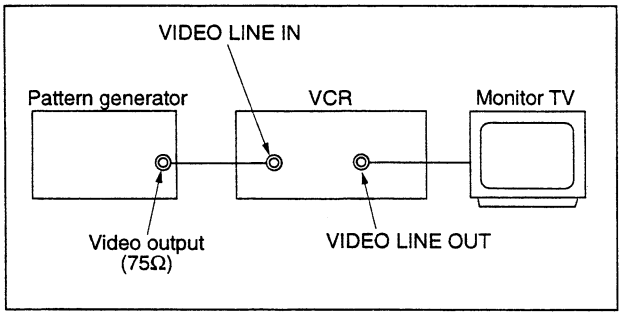


Fig. 7-2-1.

2-1-3. Input Signal Check

Video signal produced by a pattern generator is used as an adjustment signal to perform electrical alignment for this unit. This video signal must satisfy the specification.

Unless otherwise specified, place the switches and controls of this unit in the following positions:

- CHANNEL switch ..... LINE 1

Connect an oscilloscope to the Video Input terminal. Check that the synchronizing signal of the Y signal has an amplitude of approximately 0.7V and that the burst signal has an amplitude of approximately 0.3V and its waveform is flat. And check that the level ratio of burst signal to "red" signal is 0.30 : 0.66. The video signal (color bar) used for electrical aligning this unit is shown in Fig. 7-2-2.

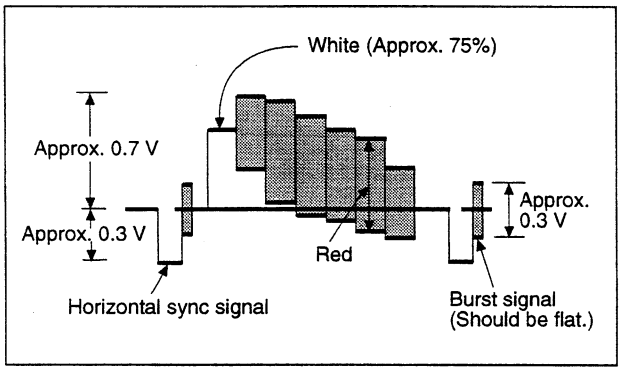


Fig. 7-2-2. Color Bar Signals of Pattern Generator

2-1-4. Alignment Tape

• Contents of KRV-51P

	Mode	Period	Video signal	Audio signal	
				Hi-Fi	Normal
1	SP	7 minutes	Color bar	400Hz (L/R)	400Hz
2		3 minutes	Monoscope		
3	LP	7 minutes	Color bar		
4		3 minutes	Monoscope		

2-1-5. Input/Output Levels and Impedance

Video input: LINE IN
Input signal: 1Vp-p, 75ohms, unbalanced, sync negative

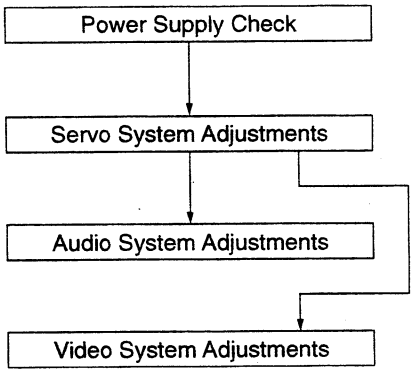
Video output: LINE OUT
Output signal: 1Vp-p, 75ohms, unbalanced, sync negative

Audio input: LINE IN
Input level: –7.5 dBs
(0dBs= 0.775Vrms)
Input impedance: more than 47 kilohms

Audio output: LINE OUT
Standard level: –7.5dBs at load impedance 47 kilohms
Output impedance: less than 10 kilohms

2-1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



2-2. POWER SUPPLY CHECK

2-2-1. Output Voltage Check (MA-290/291 Board)

Mode	E-E
Measuring Instrument	Digital voltmeter
SW 12V Check	
Measurement point	CN600 pin ⑧
Specified value	12.0 ± 0.5V
MTR12V Check	
Measurement point	CN600 Pin ⑫⑬
Specified value	13 ± 0.6V
SW5V Check	
Measurement point	CN600 Pin ⑰⑱
Specified value	5.0 ± 0.5V

[Check Method]

1) Each of these supply voltages must meet its specified value.

2-3. SERVO SYSTEM CHECK

Unless otherwise specified, set the switches to the following positions.

- CHANNEL switch ..... LINE
- TAPE SPEED switch ..... SP

2-3-1. RF Switching Position/ AF Switching Position Adjustments (MA-290/291, RP-218/220 Boards)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: Video LINE OUT (RF switching position) CN341 pin ① (HF ADJ) (AF switching position) (RP218/220 board) CH2: CN261 pin ③ (RF SWP) (RP-218/220 board)
Measuring instrument	Oscilloscope
Specified value	6.5 ± 0.5H (416 ± 32 µsec)

[Adjustment Method]

1) Short-circuit between pin ⑯ of IC161 (MA-290 board) or JS161 (MA-291 board) and ground for about 1 second to activate the RF switching position adjustment mode.
2) Check that "ADJ-RF" is indicated on FL display.

[HiFi Model]

3) Using the channel + and – buttons, adjust to 416 ± 32µsec (6.5 ± 0.5H).
4) Press the PAUSE button.
5) The set goes to the AF switching position adjustment mode.

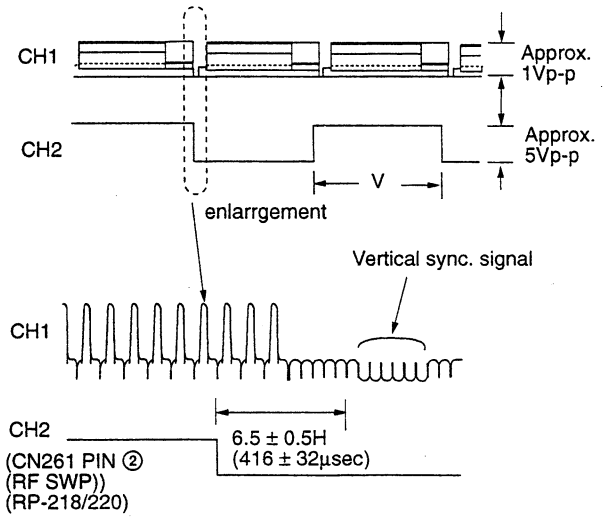


Fig. 7-2-3.

6) Check that "ADJ-HF" is indicated on FL display.
7) Using the channel + and – buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
8) Press the PAUSE button.
9) Press the EJECT button.

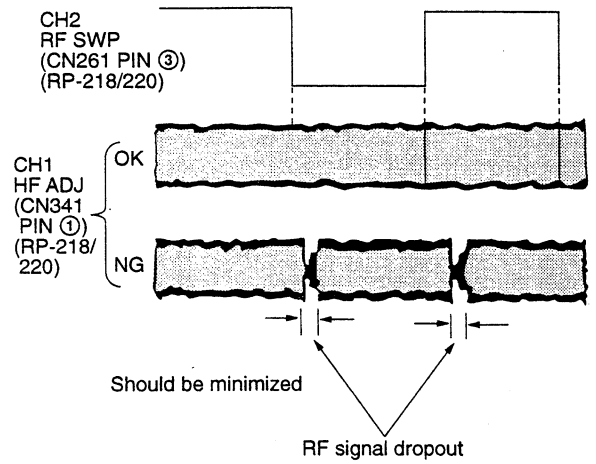


Fig. 7-2-4.

[MONO MODEL]

3) Press EJECT button to adjust RF SWP automatically. While automatically adjusting "ADJ-ERR" is indicated on FL display. Press STOP button and perform again from the item 1).
4) Press EJECT button.

2-4. VIDEO SYSTEM CHECKS AND ADJUSTMENT

For the video system checks, follow the checking procedures given below as a rule. The color bar video signal supplied from the pattern generator is used as the video input signal for the video system adjustment of the recording mode. Check that the signal satisfies the specified value designated in the "Check of input signal" (Fig. 7-2-2)

Unless otherwise specified, set the switches to the following positions.

- CHANNEL switch ..... LINE 1
- TAPE SPEED switch ..... SP

[Checking Sequence]

1) X'tal OSC Check
2) SYNC AGC Check
3) White clip/Dark clip Check
4) Recording Y Level Check
5) Recording Chroma Level Check
6) Playback Level Check
7) VCO frequency adjustment

2-4-1. X'tal OSC Check (MA-290/291 Board)

Mode	Playback
Signal	Alignment tape: SP Color bar portion
Measurement point	IC201 pin ⑤⑨
Measuring instrument	Oscilloscope and Frequency counter
Specified value	4,433,619 ± 96Hz

Note: A frequency counter should be connected through a buffer amplifier (oscilloscope, etc.) having a high impedance and a low capacitance.

[Check Method]

1) Check that the oscillation frequency satisfies the specified value and that the oscillation voltage is 500 ± 200mVp-p.

4,443,619 ± 90Hz

Fig. 7-2-5.

2-4-2. SYNC AGC Check (MA-290/291 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC201 pin ㊳
Measuring instrument	Oscilloscope
Specified value	A=2.10 ± 0.14Vp-p

[Check Method]

1) Check that the Video signal level (A) satisfies the specified value.

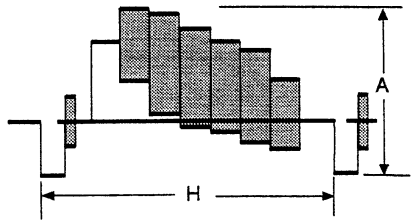


Fig. 7-2-6.

2-4-3. White Clip/Dark Clip Check (MA-290/291 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC201 pin ㊲
Measuring instrument	Oscilloscope
Specified value	White clip : 190 ± 15% Dark clip : 50 ± 10%

Connect a resistor of 3.3kΩ between CN306 pin ⑪ and GND.

[Check Method]

1) Check that the white clip level is 190 ± 15% to the white (100%) level.
2) Check that the dark chip level is 50 ± 10% to the white (100%) level.

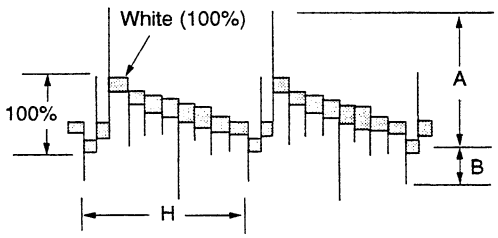


Fig. 7-2-7.

2-4-4. Recording Y Level Check (MA-290/291 Board)

Mode	E-E
Signal	No-signal
Measurement point	IC201 pin ㊷
Measuring instrument	Oscilloscope
Specified value	A=250 ± 50mVp-p

[Check Method]

1) Check that the recording RF signal satisfies the specified value.

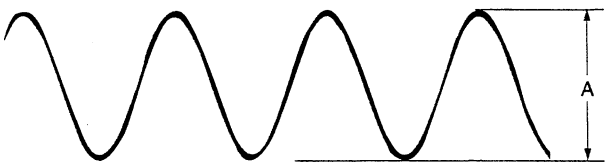


Fig. 7-2-8.

2-4-5. Recording Chroma Level Check (MA-290/291 Board)

Mode	Recording
Signal	Color bar
Measurement point	IC201 pin ⑭
Measuring instrument	Oscilloscope
Specified value	A=380 ± 40mV

[Check Method]

1) Confirm the amplitude of recording chroma level becomes the specified value.

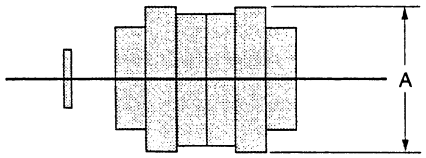


Fig. 7-2-9.

2-4-6. Playback Level Check (MA-290/291 Board)

Mode	Playback
Signal Alignment	Alignment tape : SP mode color bar portion
Measurement point	Video LINE OUT terminal
Measuring instrument	Oscilloscope
Specified value	A=1.00 ± 0.02Vp-p

[Check Method]

1) Check that the playback level satisfies the specified value.

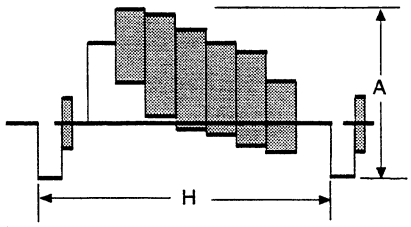


Fig. 7-2-10.

2-4-7. VCO Frequency Adjustment (MA-291 Board)

Mode	Playback
Signal	Alignment tape : SP mode color bar portion
Measurement point	IC500 pin ㉖
Measuring instrument	Digital voltmeter
Adjustment element	CT500
Specified value	A=2.75 ± 0.05Vdc

[Check Method]

1) Adjust CT500 until DC output level at IC 500 pin ㉖ (F. C) satifies the specification.

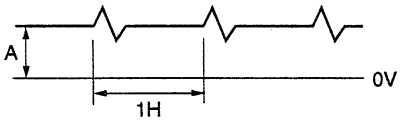


Fig. 7-2-11.

2-5. AUDIO SYSTEM ADJUSTMENT

- For the adjustment of the audio system, perform in the SP mode if there is no special notes. Use the alignment tape.

[Connecting Instruments]

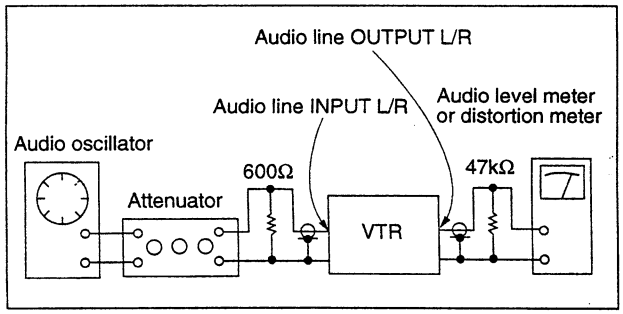


Fig. 7-2-12.

- Adjust in the SP mode if there is no special indications.
- Perform the adjustment setting the switch on the following positions.
- CHANNEL switch ..... LINE 1

[Adjustment Method]

1. ACE head adjustment.....Refer to the VHS mechanical adjustment manual Ⅳ.
2. E-E output level check
3. Overall Output level and distortion factor check
4. Overall noise level check.

2-5-1. ACE Head Adjustment

Refer to the "VHS mechanical adjustment manual Ⅳ" (9-973-623-11).

2-5-2. E-E Output Level Check

Mode	E-E
Signal	400Hz, –7.5dBs : CJ570 L/R
Measurement point	CJ570 L/R
Measuring instrument	Audio level meter
Specified value	–7.5 ± 2dBs

[Check Method]

1) Input signal of 400Hz and –7.5dBs to the CJ570 L/R.
2) Check that the audio output level is –7.5 ± 3dBs.

2-5-3. Overall Output Level and Distortion Factor Check

Mode	Self-record playback
Signal	400Hz, –7.5dBs : CJ570 L/R
Measurement point	CJ570 L/R
Measuring instrument	Audio level meter and Distortion meter
Specified value	Playback Level: –7.5 ± 3dBs Distortion: 4.0% or less

[Check Method]

1) Input signal of 400Hz and –7.5dBs to the audio input.
2) Record signal.
3) Playback the recorded portion.
4) Check that the output level is –7.5 ± 3dBs.
5) Check that the distortion factor is 4.0% or less.

2-5-4. Overall Noise Level Check

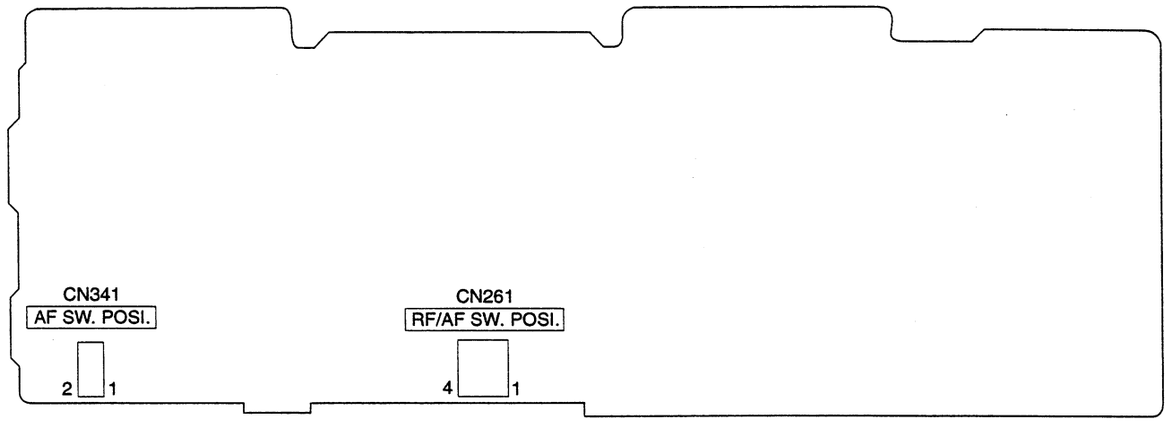
Mode	Self-record playback
Signal	No signal (Insert a shorting plug into the Audio LINE IN terminal)
Measurement point	CJ570 L/R
Measuring instrument	Audio level meter (IHF-A weighing filter is used)
Specified value	– 45.5dBs or less

[Check Method]

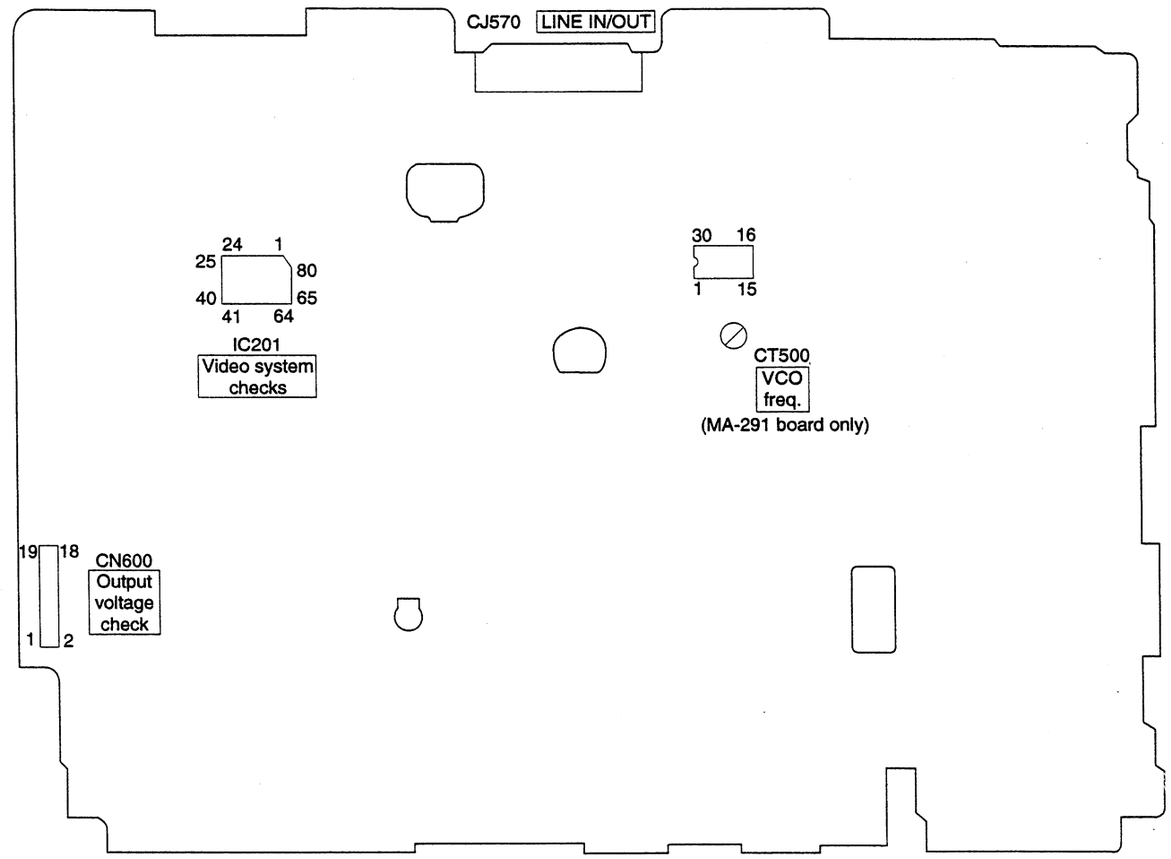
1) Record.
2) Playback recorded portion.
3) Check that noise level is – 45.5dBs or less.

2-6. ADJUSTMENT PARTS LOCATION DIAGRAM

RP-218/220 BOARD (Conductor side)



MA-290/291 BOARD (Conductor side)



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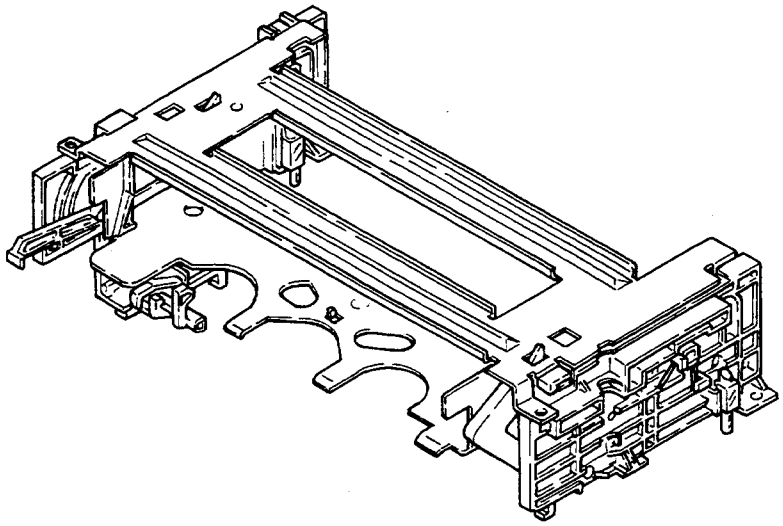
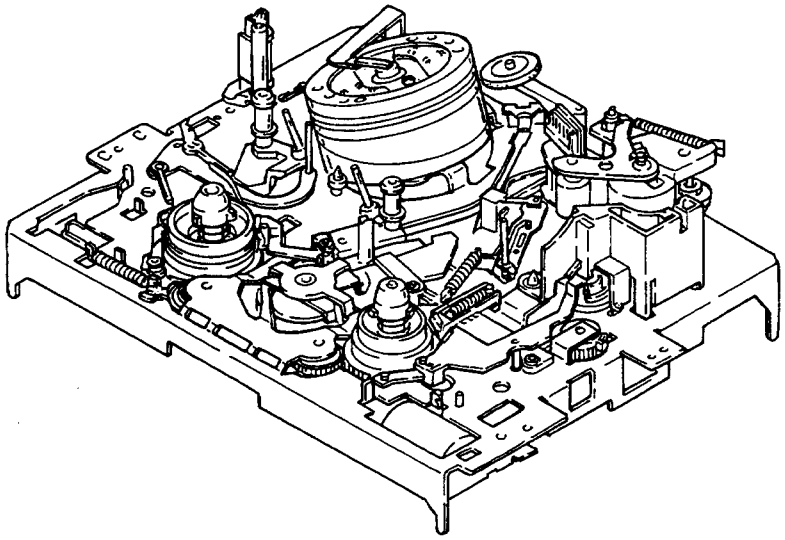
VHS MECHANICAL ADJUSTMENT MANUAL IV

H MECHANISM

Please use with the service manual.





MICROFILM

VHS VIDEO CASSETTE RECORDER

SONY®

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1. PREPARATION FOR MECHANISM CHECK ADJUSTMENT AND REPLACEMENT

Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.

1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF (Fig. 1-1)

1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓐ direction until loading and threading are end.

1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Applying approx. +9 V (300 mA) to cam motor with regulated DC power supply makes it loading and threading.

Note: When loading and threading without cassette, claws are caught in four positions as following figure (in the order ① → ② → ③ → ④).
So release them with hands.

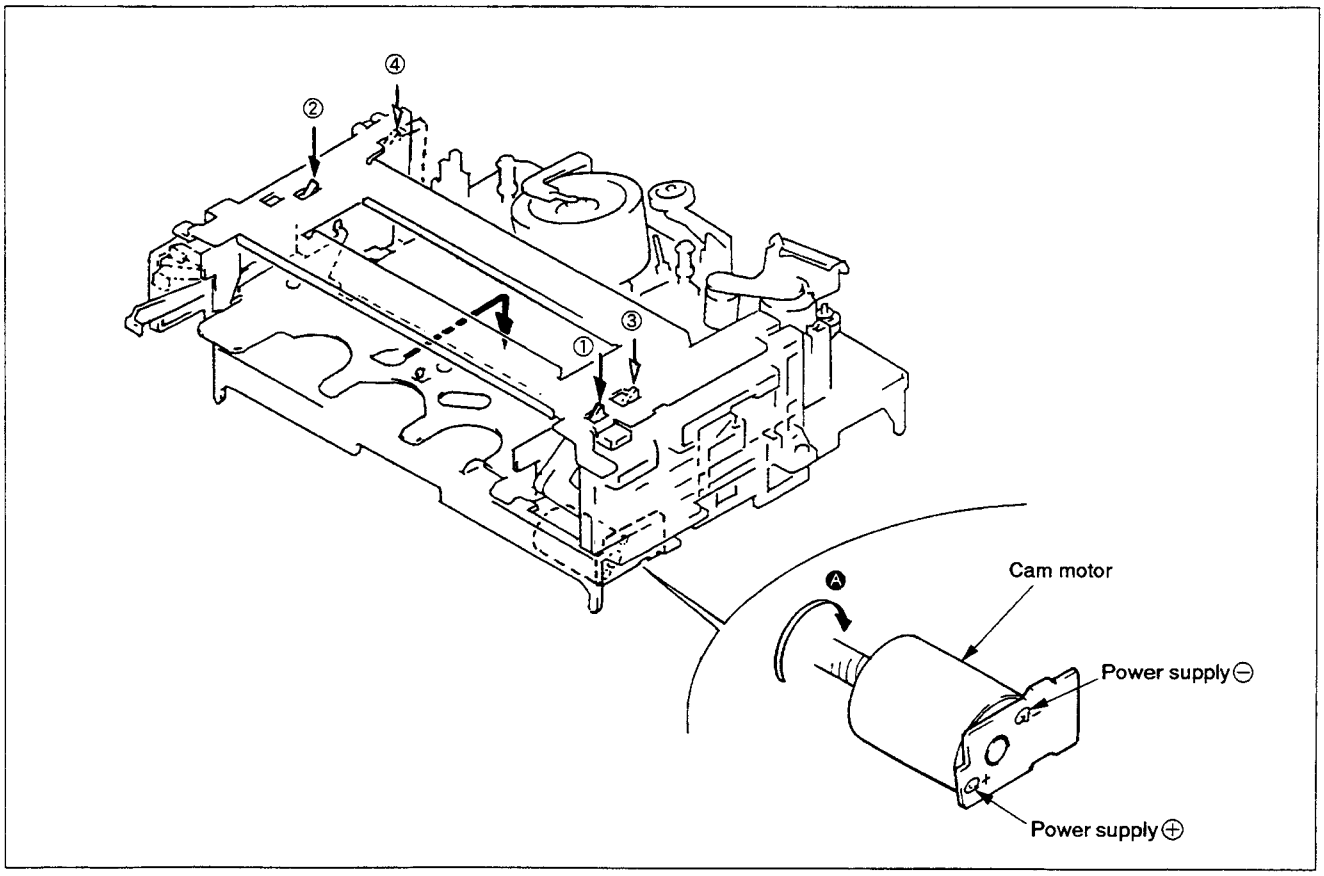


Fig. 1-1

1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF (Figs. 1-2 and 1-3)

1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓑ direction until unthreading is end.
2) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.
3) Turn cam motor in the arrow Ⓑ direction until unloading is end.

1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Apply approx. +9 V (300 mA) to contrary polarities of cam motor.
2) Unthreading operation begins, tape guides return to their original positions (Unthreading operation is end but tape remains), then stop cam motor by turning power off.

Note: When unloading begins and cassette lid is closed, turn cam motor in the arrow Ⓐ direction to open tape guard.

3) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.

Note: That tape is not caught at pinch roller. (Fig. 1-3)

4) Check that tape is not loosened completely, and apply approx. +9 V (300 mA) to contrary polarities of cam motor with regulated DC power supply. (Fig. 1-2)

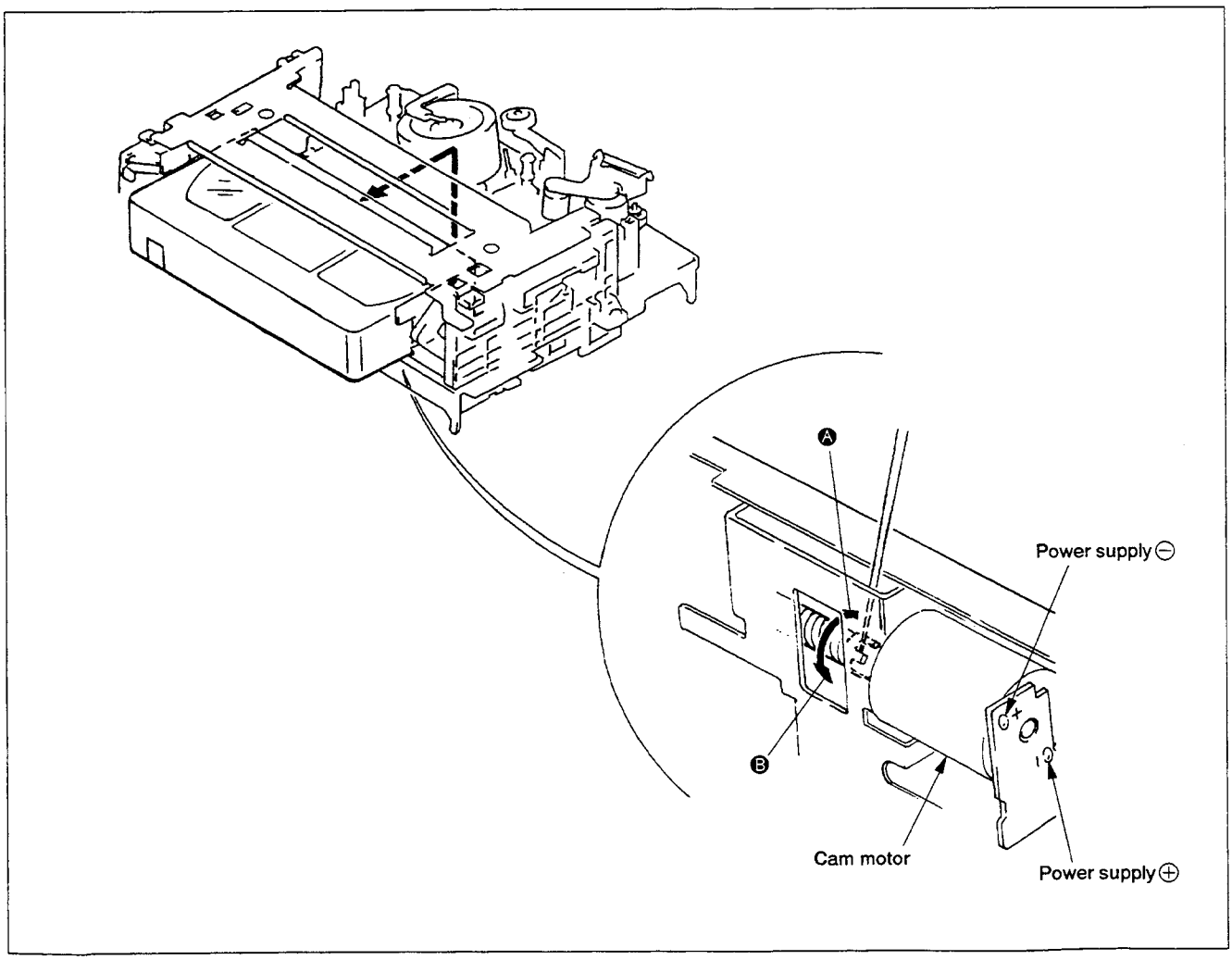


Fig. 1-2

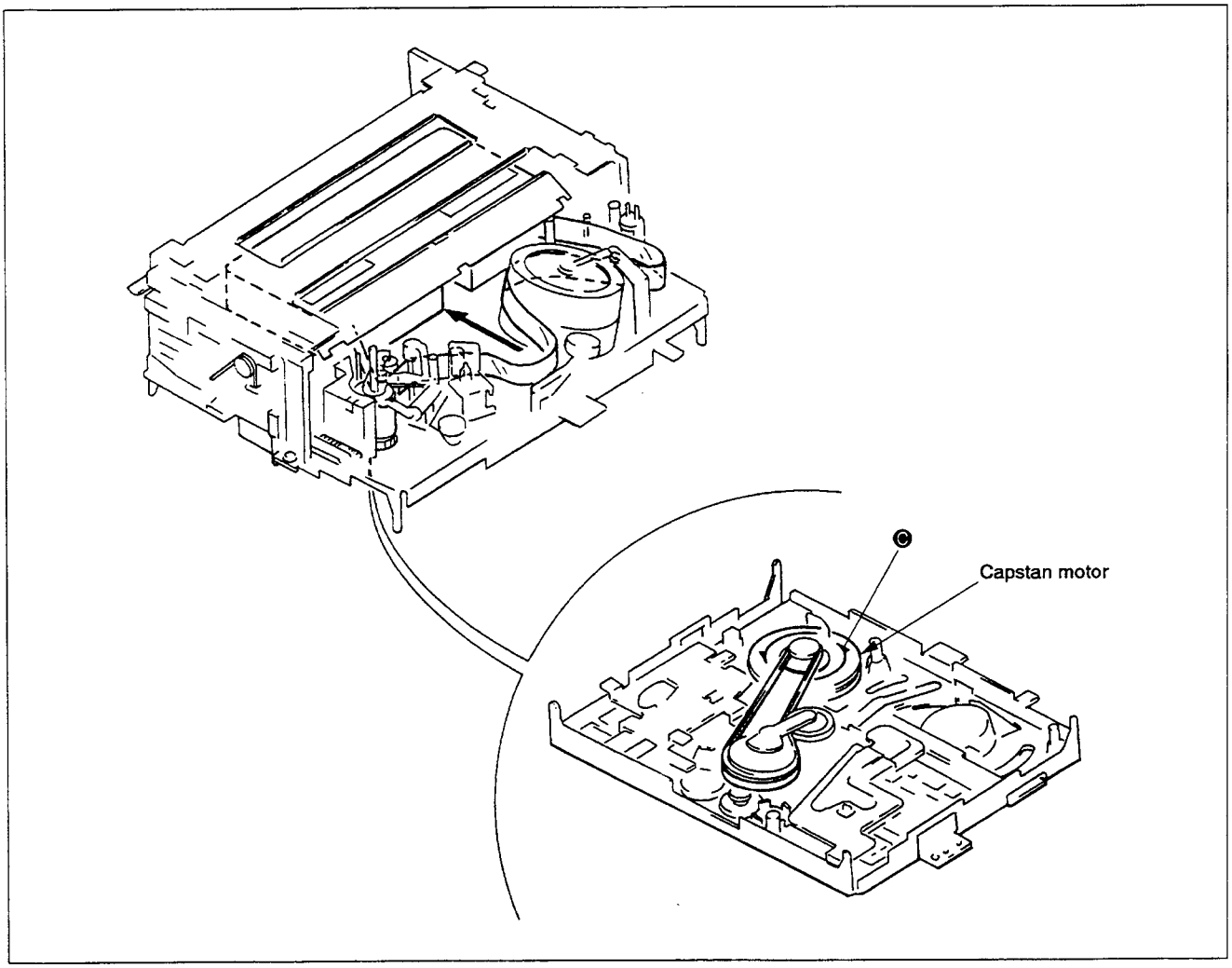


Fig. 1-3

1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT (Fig. 1-4)

Note 1: Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them. (Fig. A)

1) Pull out AC plug from wall outlet.
2) Shade near the end and top sensors with a black masking tape on the like.
3) Press cassette in/rec proof switch with a tip of screwdriver or the like.
4) Connect AC plug to wall outlet.
5) Release cassette in/rec proof switch by putting off a tip of screwdriver or the like.
   (At this time, power turns on, rewind operates for 10 seconds, after that power turns off.)

Note 2: In this condition, each mode can be set to video cassette recorder. (including recording mode)
However, fast forward should be done after rewinding for 15 seconds or more.

Note 3: After above mentioned operation, be sure to return the mode in the following order.

1) Remove the tape near the end and top sensors.
2) Pull out AC plug from wall outlet to reset the system control microcomputer.

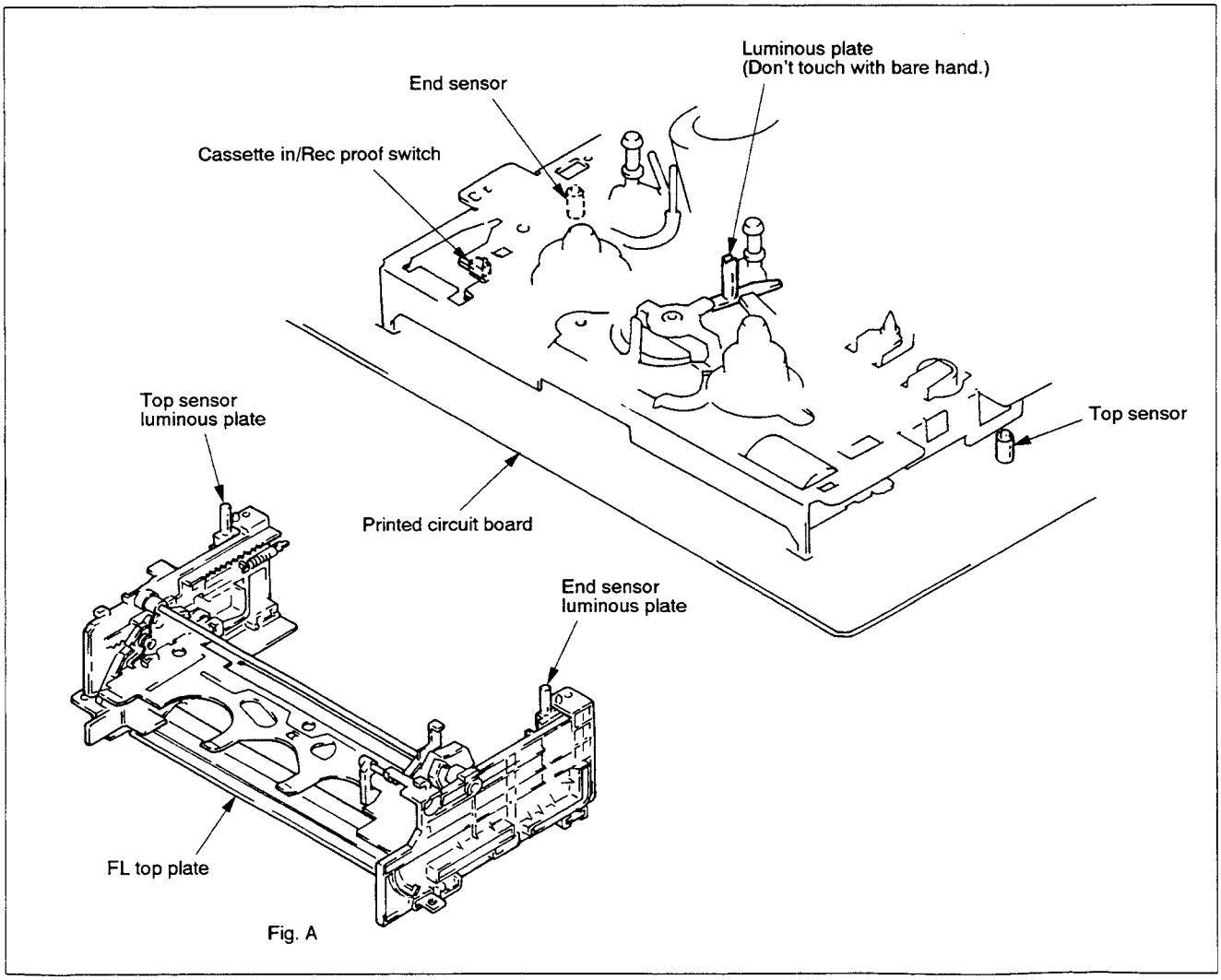


Fig. 1-4

2. PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-9) which has been dipped in cleaning fluid (Jig Ref. No. J-8) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that been dipped in cleaning fluid.

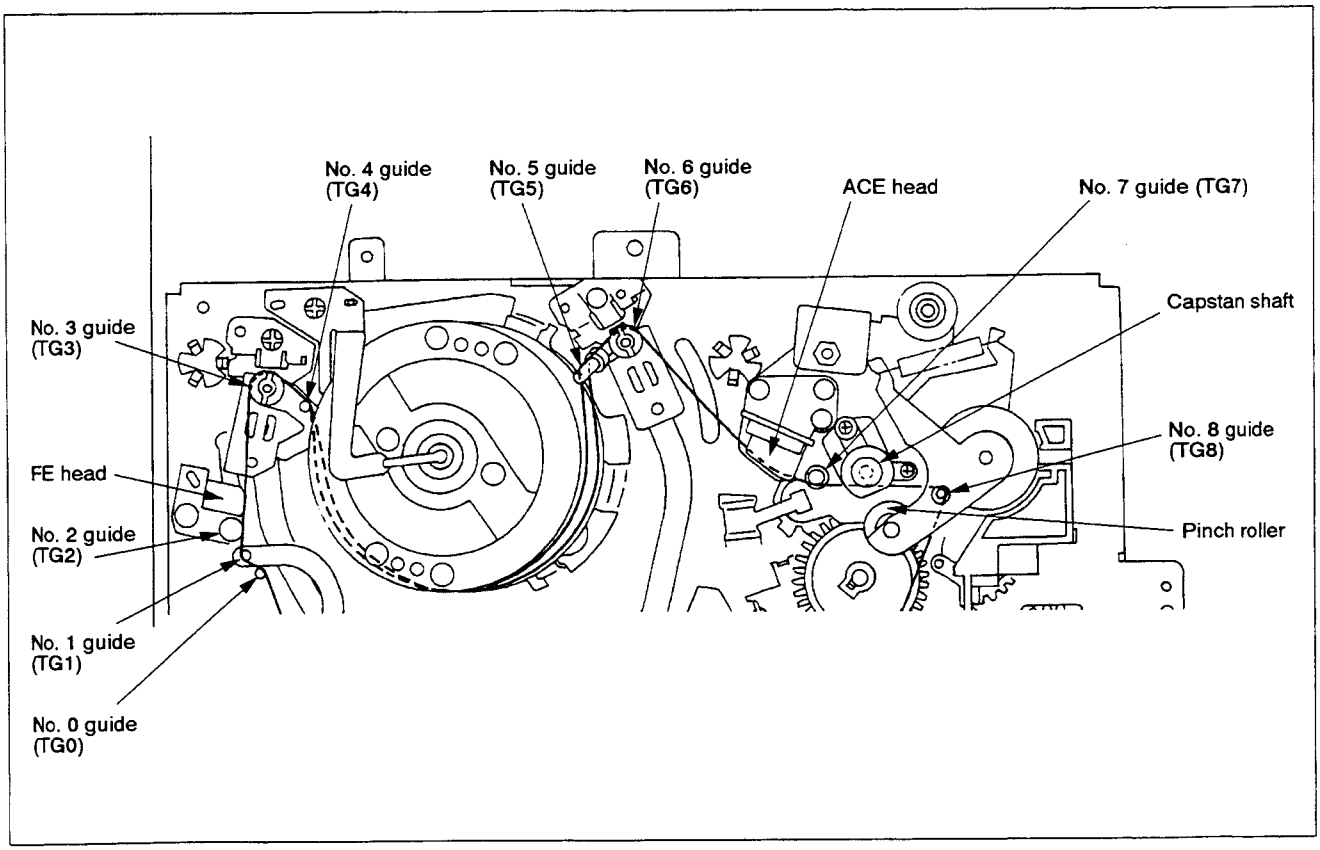


Fig. 2-1 Parts requiring cleaning

2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users operating hours.

Maintenance & Check \ Operating Hours (H)		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE assembly	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of upper drum assembly	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Performance Confirmation	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to 4-1-1. Specified value: adjust to 36 to 44 g•cm (when measured with torque cassette tape)
	Confirmation of brake system	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to section.
	Confirmation of record & playback functions	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 70 to 120 g•cm

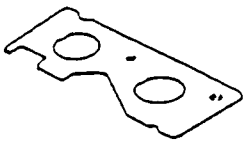
○ Cleaning ☆ Confirmation

Note: On overhaul
When overhauling the unit, replace parts as indicated in the above table.

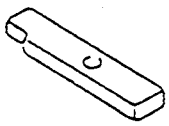
2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref No.	Name	Part No.	Carved Jig No.	Remarks
J-1	Master Plane	H-7099-279-H		Applicable to S-VHS
J-2	Reel Disk Height Jig	H-7099-038-H		
J-3	Torque Gauge Adaptor	H-7099-035-H		
J-4	0.93 mm Torque Gauge	H-7099-039-H		
J-5	Hex. Wrench	H-7099-202-H		
J-6	Torque Measurement Cassette VHT-063S	J-6082-011-A		For FWD & back tension torque measurement.
	Torque Measurement Cassette VHT-404S	J-6082-012-A		For CUE and review torque measurement.
J-7	Alignment Tape JVC-MH-1 (NTSC) 24HASF-2 (NTSC Hi-Fi) JVC-MH-2 (PAL) JVC-MH-4 (SECAM)	 H-7099-046-H H-7099-153-H H-7099-052-H H-7099-053-H		
J-8	Cleaning Fluid	Y-2031-001-0	———	
J-9	Chamois Leather	2-034-697-00	———	
J-10	Head Demagnetizer	Widely available	———	Demagnetize video heads and audio heads.
J-11	Dental Mirror (With handle) Dental Mirror (Mirror)	J-6080-029-A J-6080-030-1	SL-5052	Tape path and tape traveling adjustments or checks.
J-12	FLOIL SG-055G	7-651-000-09		
J-13	Diamond Oil NT-68	7-661-018-18		
J-14	Screw Lock G (1401B)	7-432-114-11		

J-1

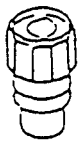


J-2

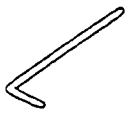


J-3

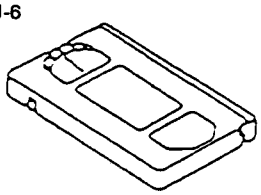
J-4



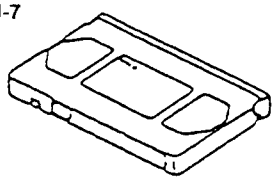
J-5



J-6



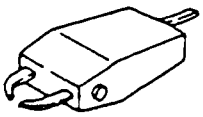
J-7



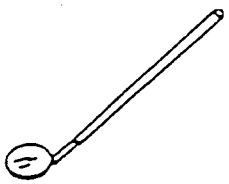
J-8

J-9

J-10



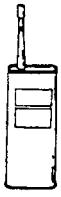
J-11



J-12

J-13

J-14



3. MAINLY MECHANICAL PARTS REPLACEMENT

Notes:

- Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.
- On mounting, while referring to notes on mounting perform reversely in the removal order.
- When replacing greased parts, grease them in the same way.
- Do not oil, grease or touch with bare hands the surfaces contacts tape of guides and brake shoes.
- Install gears to engage each other.
- Basically, disassembling and assembling should be done in the unthreading-end condition.

3-1. FL BLOCK ASSEMBLY (Fig. 3-1)

1) Remove screws ①.
2) Remove FL block assembly ② in the arrow Ⓐ direction.

Note: Be careful not to damage claws on the bottom and front.

[Note on Mounting]

- First insert claws on the bottom and front not to damage.
- Engage FL slide plate to FL driving gear with slightly sliding FL slide plate. (Fig. A)
- Keep clean top sensor and end sensor luminous plates. (Refer to 1-3.)

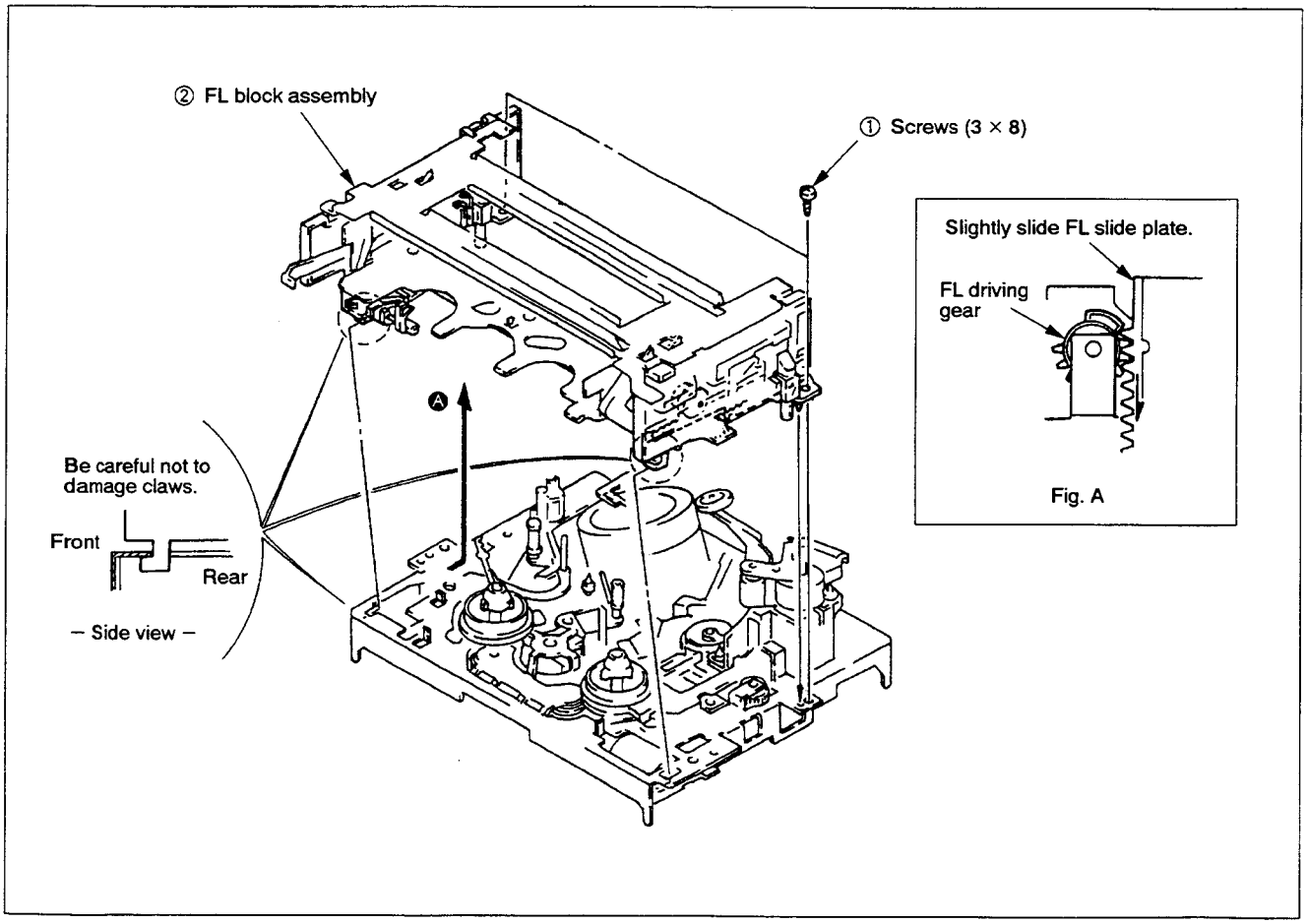


Fig. 3-1

3-2. DRUM ASSEMBLY (Fig. 3-2)

1) Remove screw ①.
2) Remove ground shaft assembly ② not to touch its tip with bare hand or tools.
3) Remove screws ③ to remove drum assembly ④.

[Note on Mounting]

- Don't touch head chips ⑤ and ground shaft assembly ④ with bare hand or tools.
- Keep clean the surface contacts tape of drum assembly ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

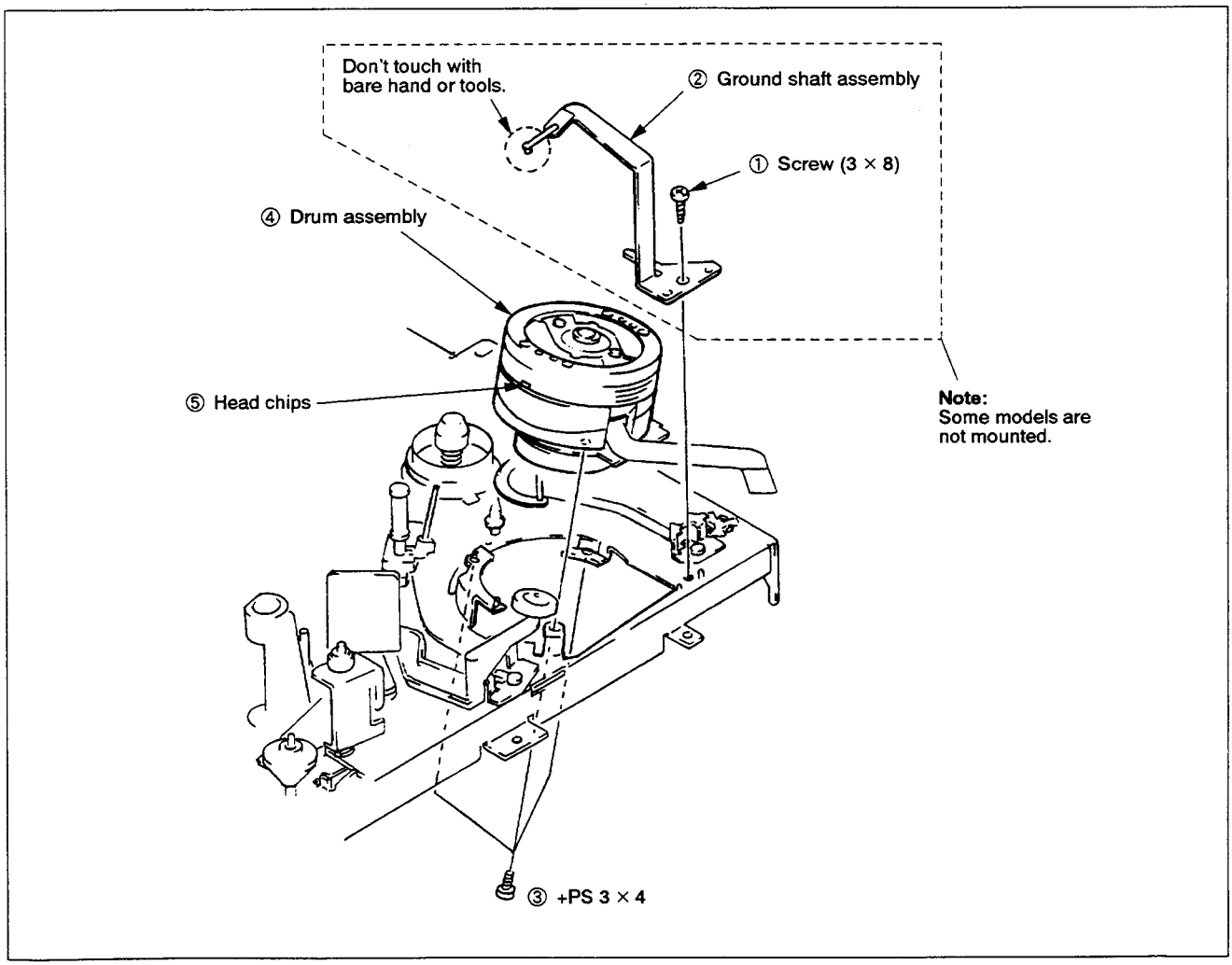

Don't touch with bare hand or tools.
② Ground shaft assembly
① Screw (3 × 8)
④ Drum assembly
⑤ Head chips
Note:
Some models are not mounted.
③ +PS 3 × 4

Fig. 3-2

3-3. TIMING BELT (Fig. 3-3)

1) Remove screw ① to remove tension vehicle arm assembly ②.
2) Remove timing belt ③.

[Note on Mounting]

- Tighten screw ① while pressing tension vehicle arm in the arrow Ⓐ direction.

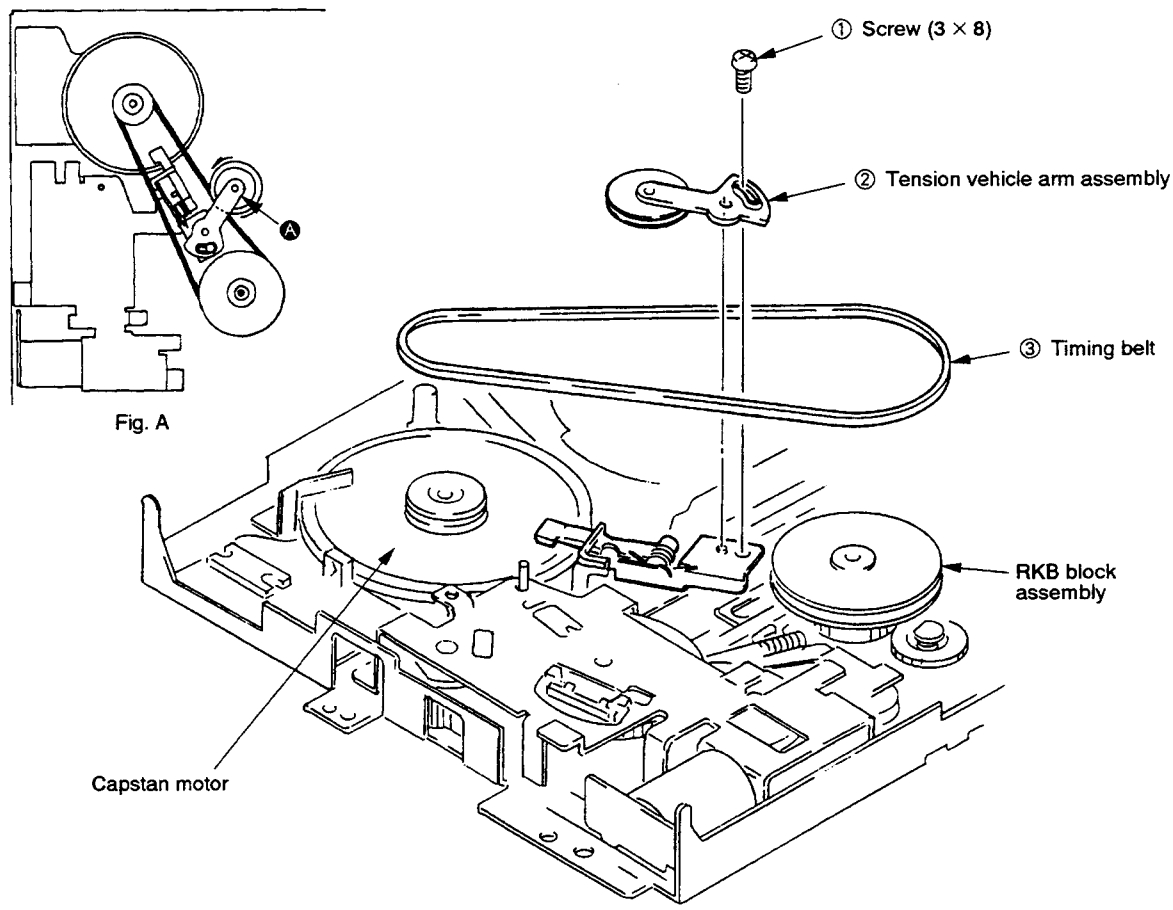


Fig. 3-3

3-4. CAP BRAKE ASSEMBLY (Fig. 3-4)

1) Remove tension vehicle arm assembly. (Refer to 3-3)
2) Remove torsion coil spring ① from portion Ⓐ to remove CAP brake assembly.

[Note on Mounting]

- Mount torsion coil spring ① to CAP brake assembly ② in the order Ⓐ and Ⓑ. (Fig. A)
- Put the fulcrum of CAP brake assembly ② to CAP brake shaft ③ and the tip of torsion coil spring to Ⓒ.
- Don't touch brake shoe Ⓓ with bare hand.

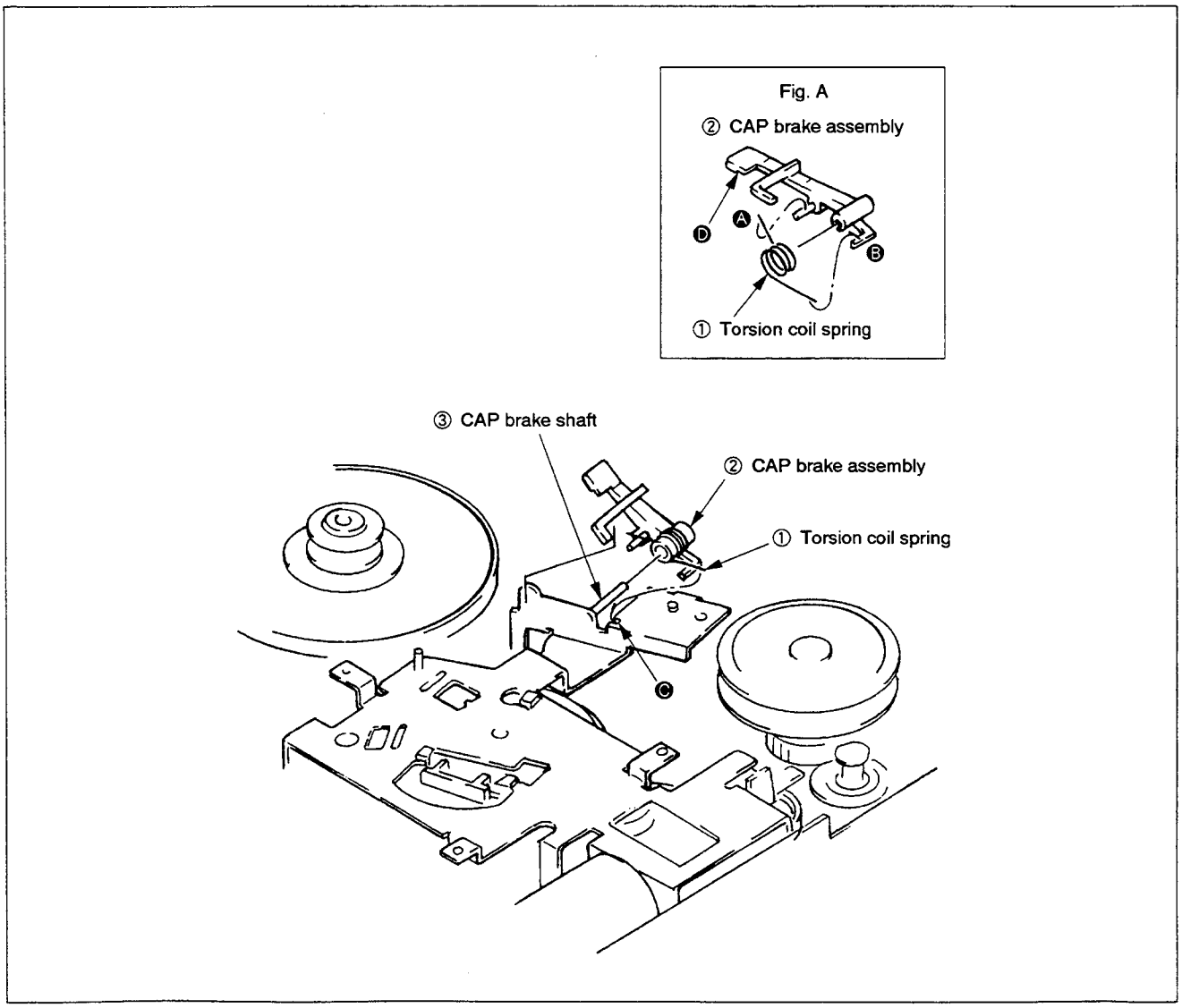


Fig. 3-4

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove claw Ⓐ to pull out TG2 roller ①.
2) Remove screw ② to pull out FE head assembly.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller ①.

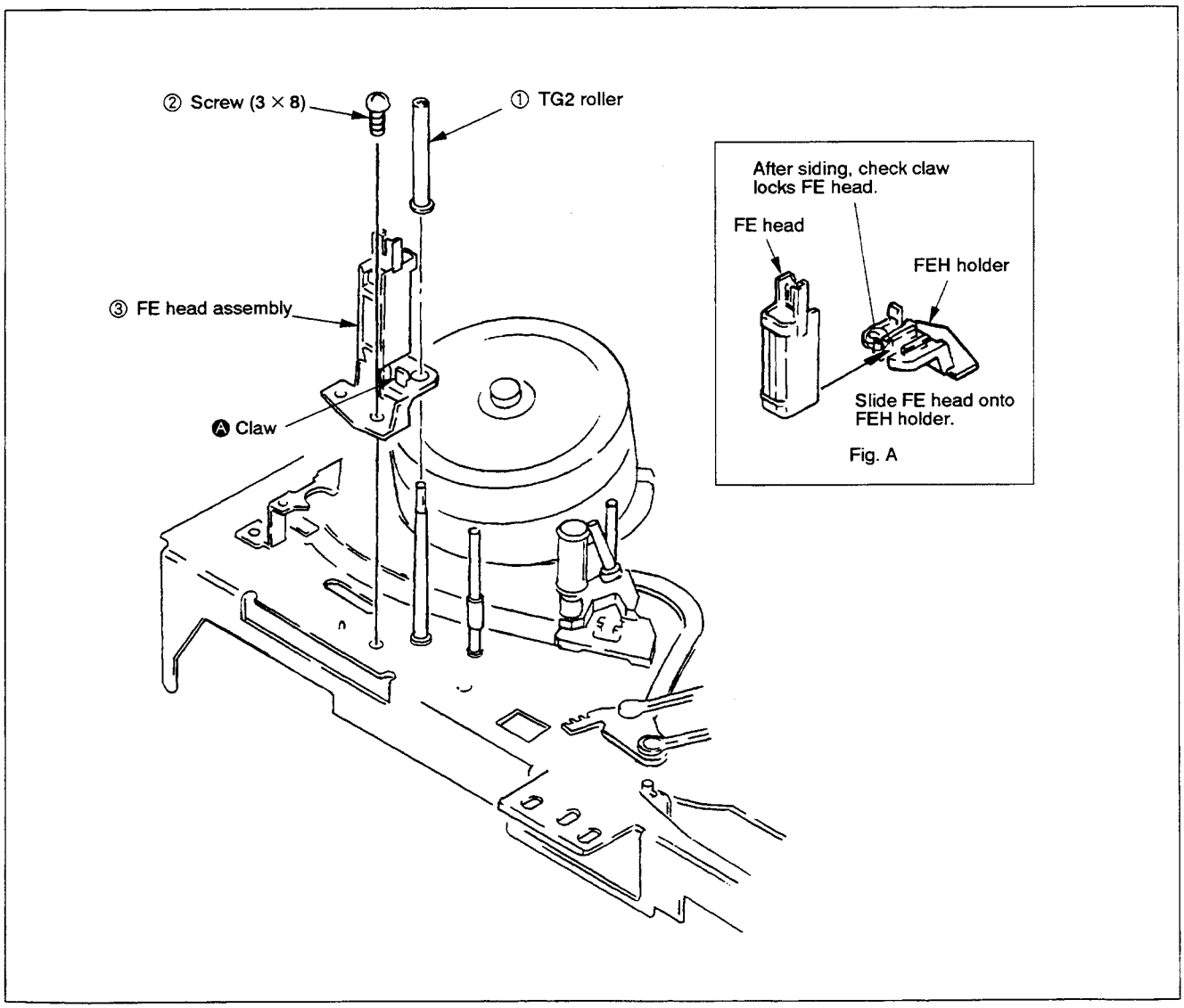


Fig. 3-5

3-6. PINCH PRESS BLOCK ASSEMBLY, ELEVATOR GEAR (Fig. 3-6)

1) Remove E ring ① to pull out pinch press block assembly ②.
2) Remove lid opener ③ by pressing claw Ⓐ in the arrow Ⓑ direction.
3) Pull out elevator gear ④.

[Note on Mounting]

- Apply grease FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.
- Be sure to match the phase Ⓒ between elevator gear ④ and press gear ⑤ on mounting elevator gear ④.

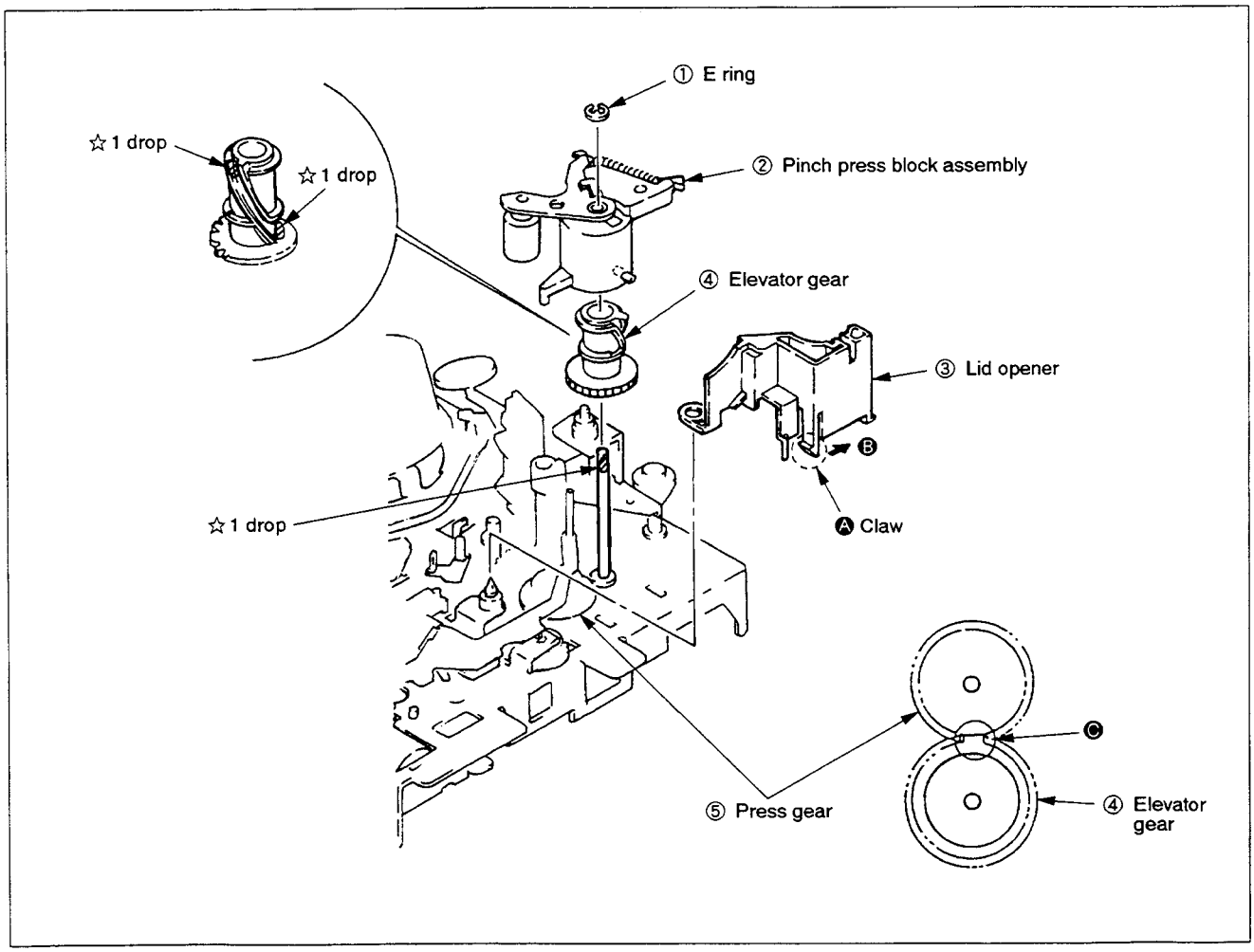


Fig. 3-6

3-7. ACE BLOCK ASSEMBLY (Fig. 3-7)

1) Move torsion coil spring (ACE) ① in the arrow Ⓐ direction.
2) Remove ACE adjustment screw ②.
3) Remove AC height adjustment nut ③ to pull out ACE block assembly ④.

[Note on Mounting]

- Keep clean the surface contacts tape of ACE block assembly ④.
- Be sure to hang torsion coil spring (ACE) ① in the arrow Ⓑ direction.
- Set ACE adjustment screw ② to the height as shown in Fig. A.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.
- After adjustment apply Screw Lock G (1401B) (Jig Ref. No. J-14) at ☆ marked portion.

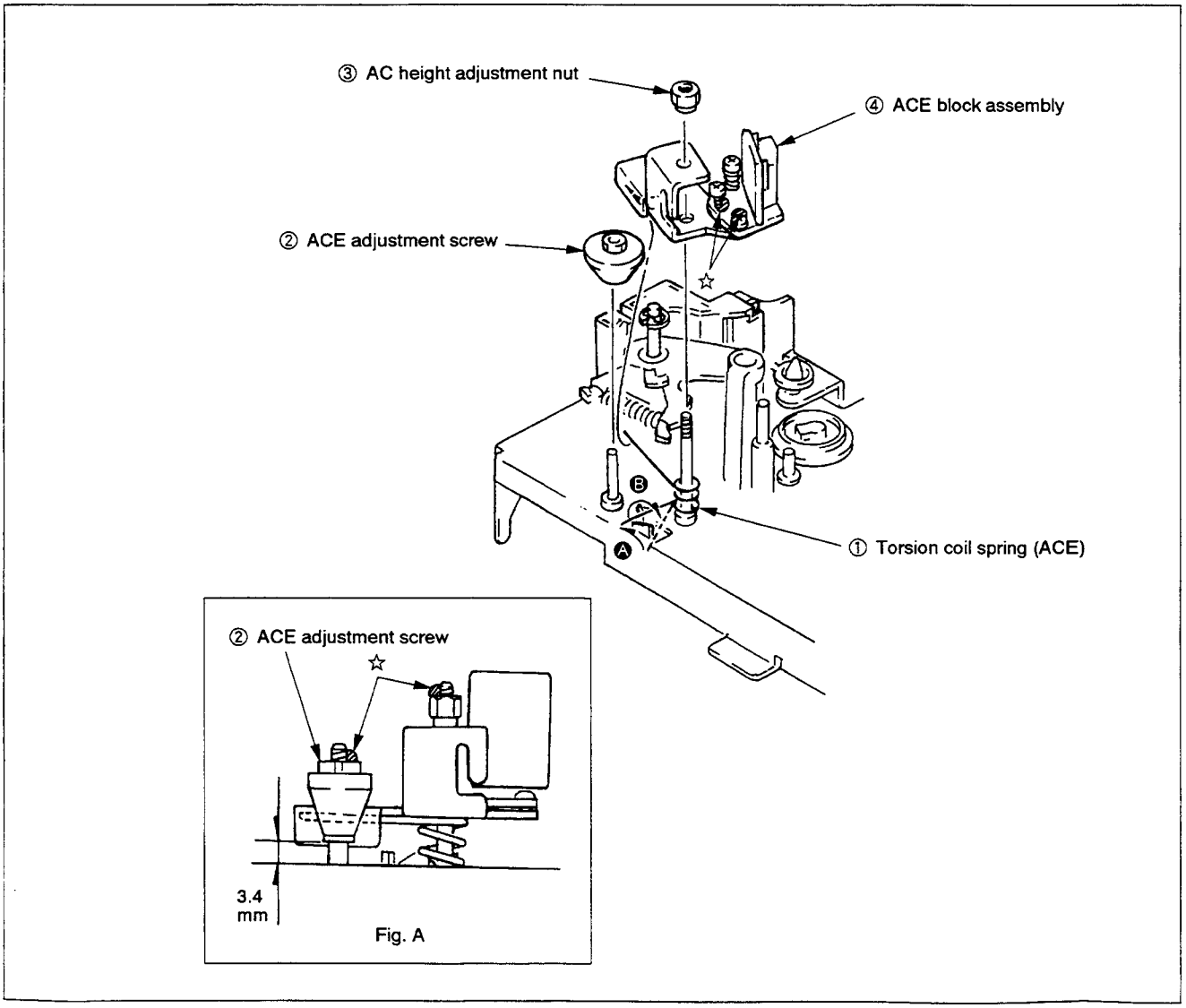


Fig. 3-7

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

1) Loosen screw ① and pull out. TG3 guide roller assembly ② by turning it in the arrow Ⓐ direction.
2) Loosen screw ③ and pull out TG6 guide roller assembly ④ by turning it in the arrow Ⓑ direction.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ②, ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

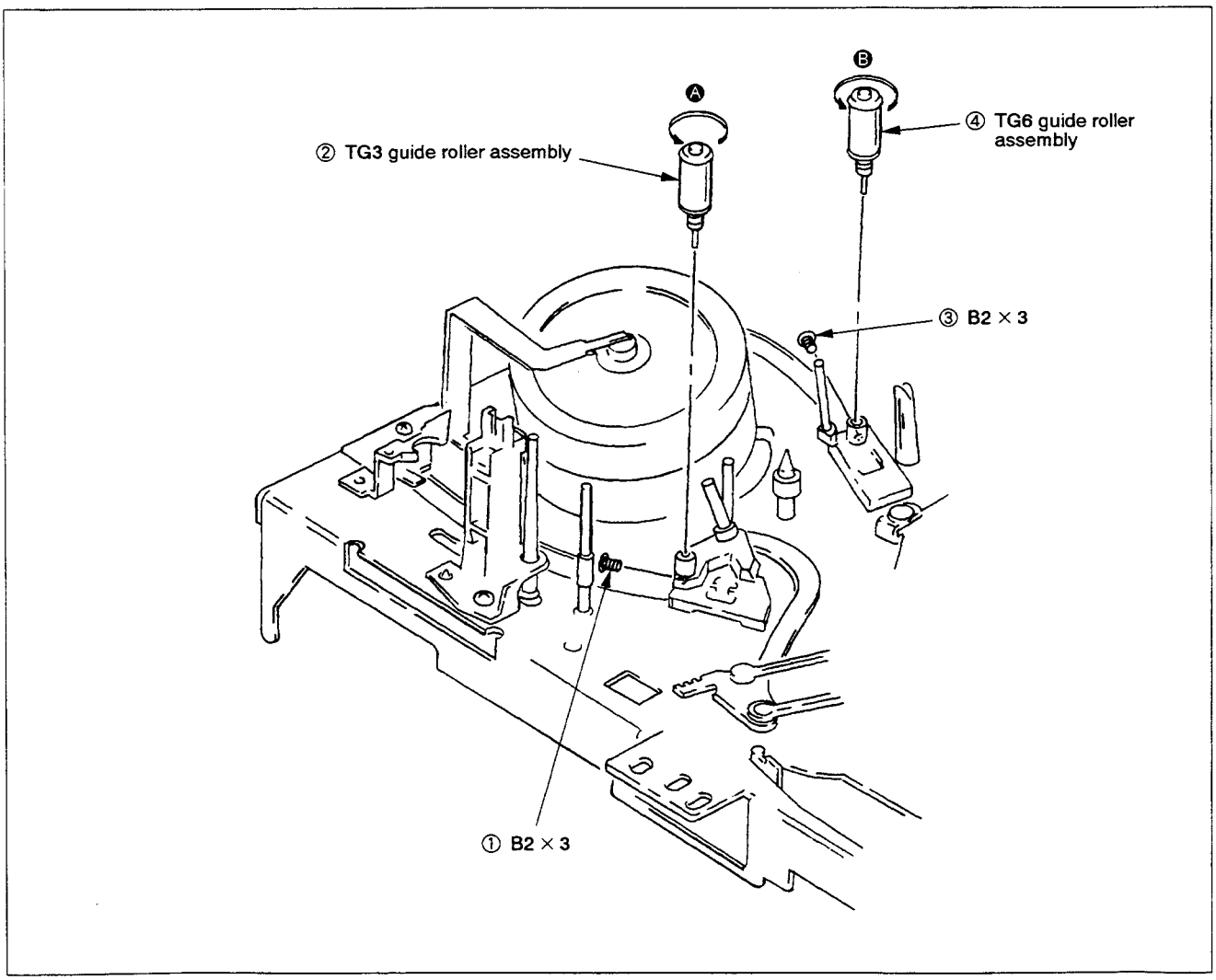


Fig. 3-8

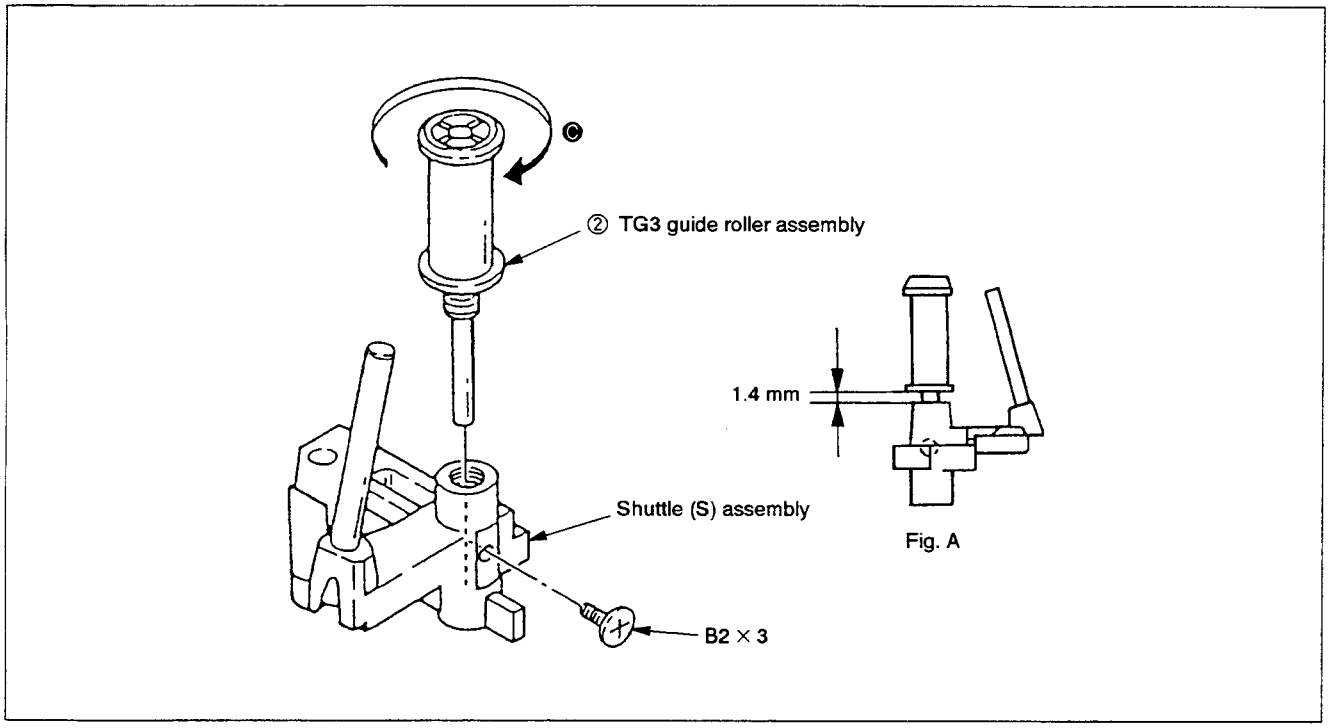


Fig. 3-9

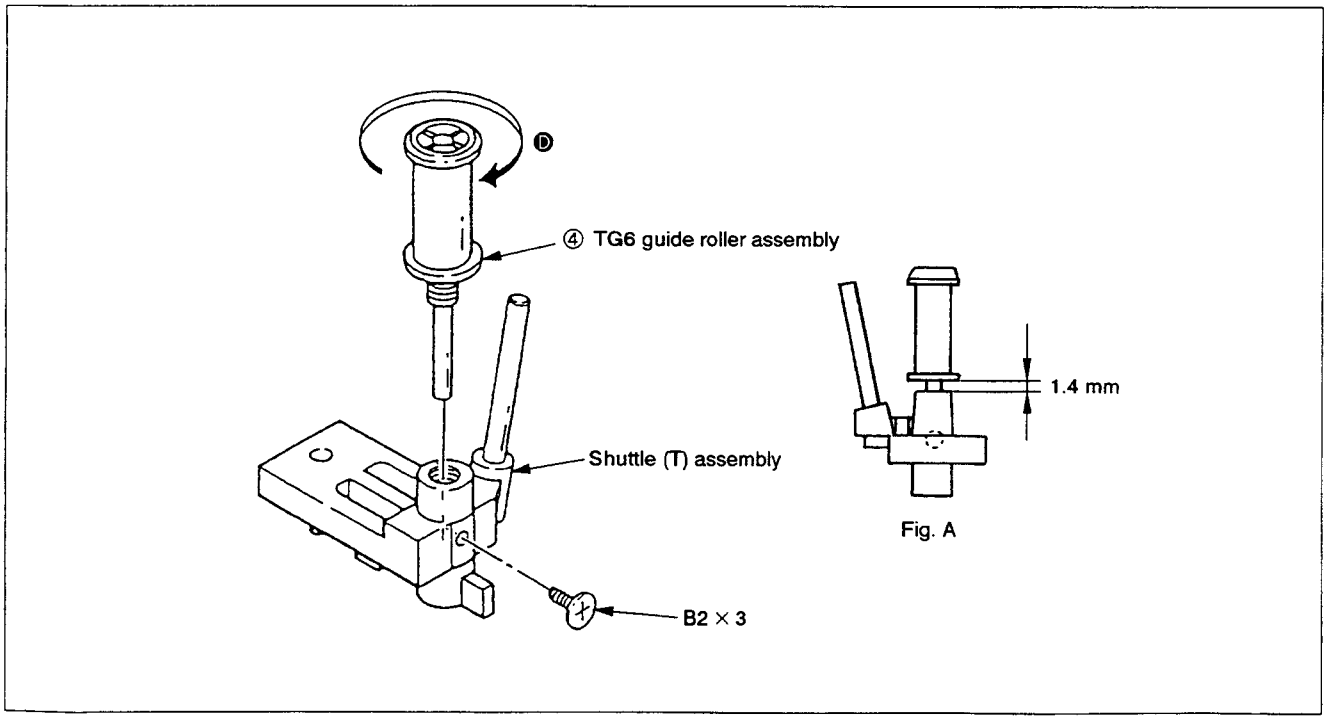


Fig. 3-10

3-9. CAPSTAN MOTOR (Fig. 3-11)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove screws ① to pull out capstan motor ②.

[Note on Mounting]

- Keep clean the surface contacts tape of capstan motor ②.
- On tightening screws ①, first tighten screw A temporarily, next tighten screws in the order B to C to A.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

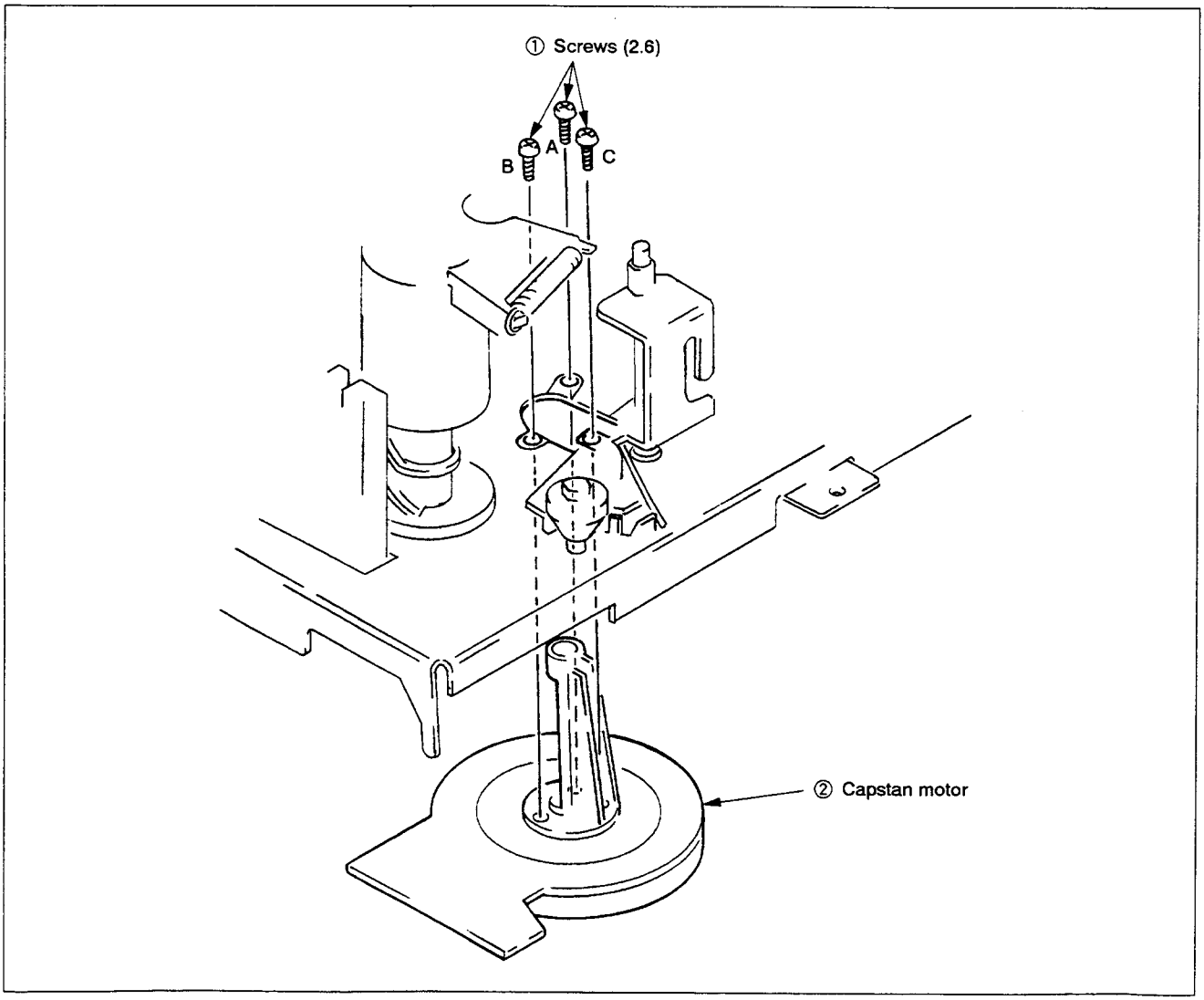


Fig. 3-11

3-10. MAIN BRAKE ASSEMBLIES S AND T (Fig. 3-12)

1) Remove tension spring ①.
2) Remove stopper washer (2) ② to remove neutrality arm ③.
3) Remove pendulum compulsion arm ④ and tension coil spring ⑤.
4) Remove stopper washer (2) ⑥ to remove main brake S assembly ⑦.
5) Remove stopper washer (2) ⑧ to remove main brake T assembly ⑨.

[Note on Mounting]

- Don't touch brake shoes Ⓐ and Ⓑ with bare hand.
- Apply FLOIL FG-055G (Jig Ref. No. J-12) to ☆ marked portions.

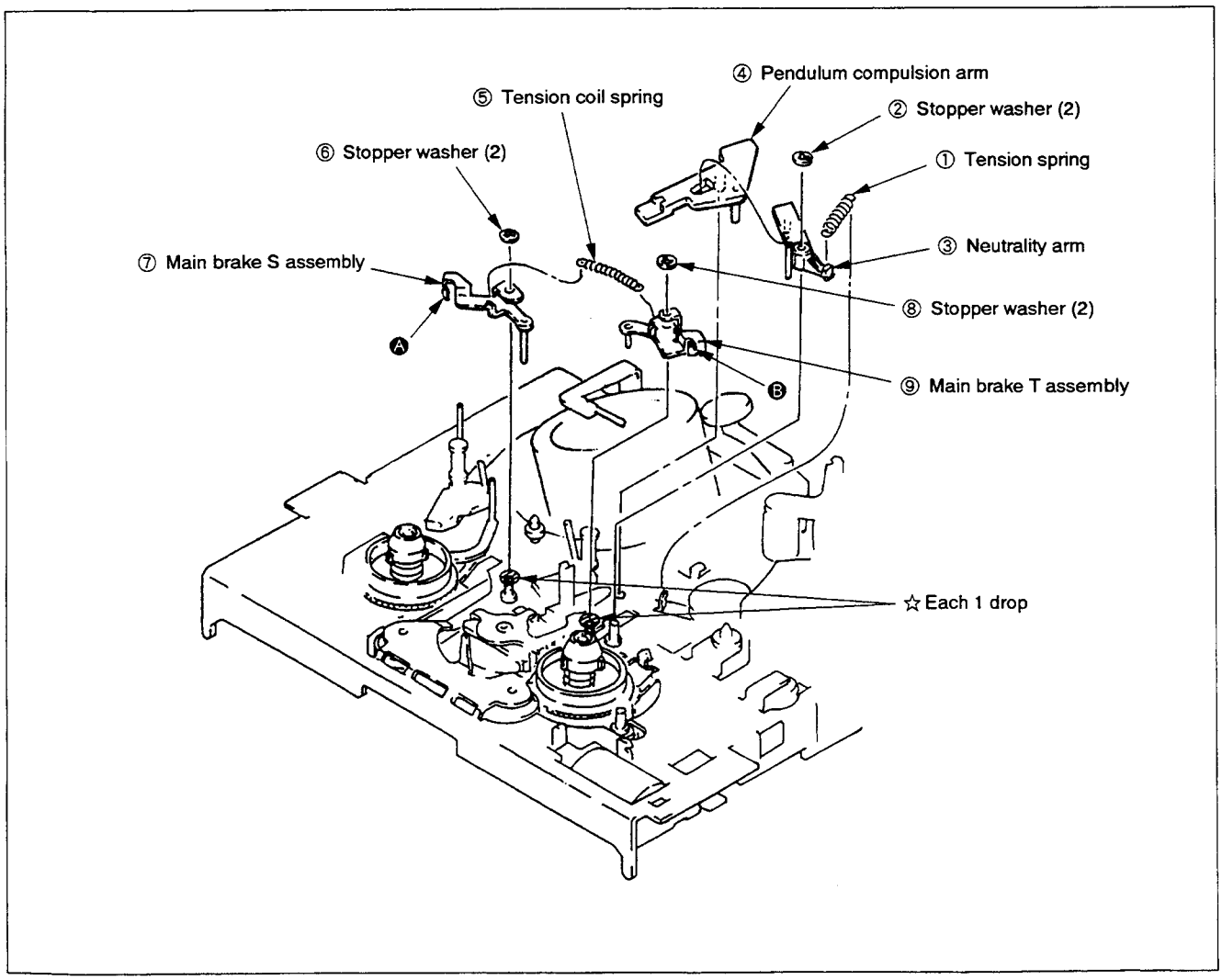

④ Pendulum compulsion arm
⑤ Tension coil spring
② Stopper washer (2)
⑥ Stopper washer (2)
① Tension spring
⑦ Main brake S assembly
③ Neutrality arm
⑧ Stopper washer (2)
⑨ Main brake T assembly
☆ Each 1 drop

Fig. 3-12

3-11. SOFT BRAKE T ASSEMBLY (Fig. 3-13)

1) Remove pinch press block assembly. (Refer to 3-6.)
2) Remove lid opener ① carefully not to damage claw Ⓐ.
3) Remove tension spring ② from side Ⓑ to pull out soft brake T assembly ③.

[Note on Mounting]

- Don't touch brake shoes Ⓒ with bare hand.

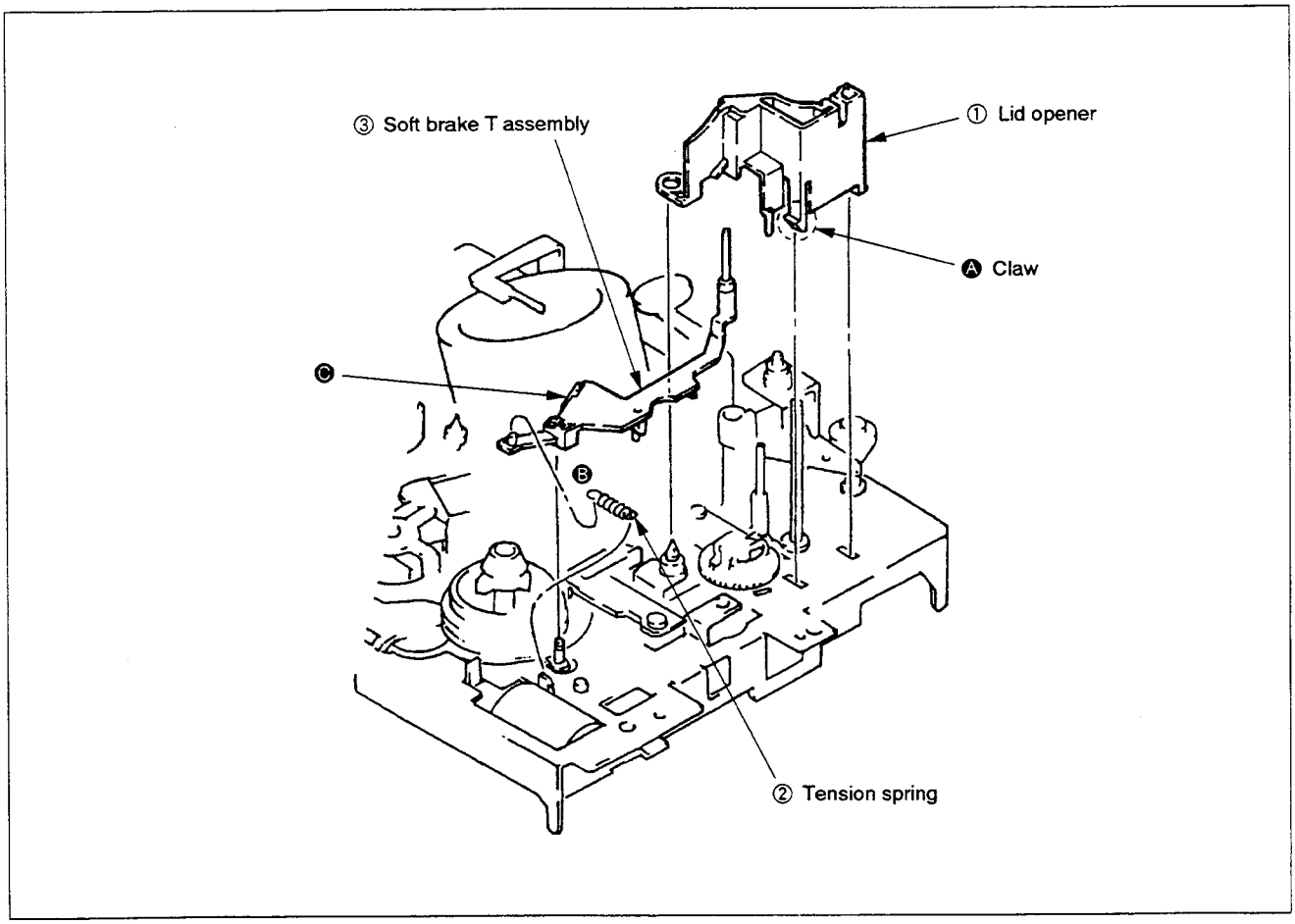


Fig. 3-13

3-12. RVS BRAKE ARM ASSEMBLY, REEL TABLE (T) ASSEMBLY (Fig. 3-14)

1) Remove main brake T assembly. (Refer to 3-10.)
2) Remove soft brake T assembly. (Refer to 3-11.)
3) Remove tension coil spring ① in the order Ⓐ to Ⓑ.
4) Remove RVS brake arm assembly ②.
5) Remove stopper washer (2) ③ to pull out reel table (T) assembly ④.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (T) assembly ④. (Fig. A)
- Don't touch the hatched portion on reel table (T) assembly ④ and brake shoe Ⓒ of RVS brake arm assembly ② with bare hand.

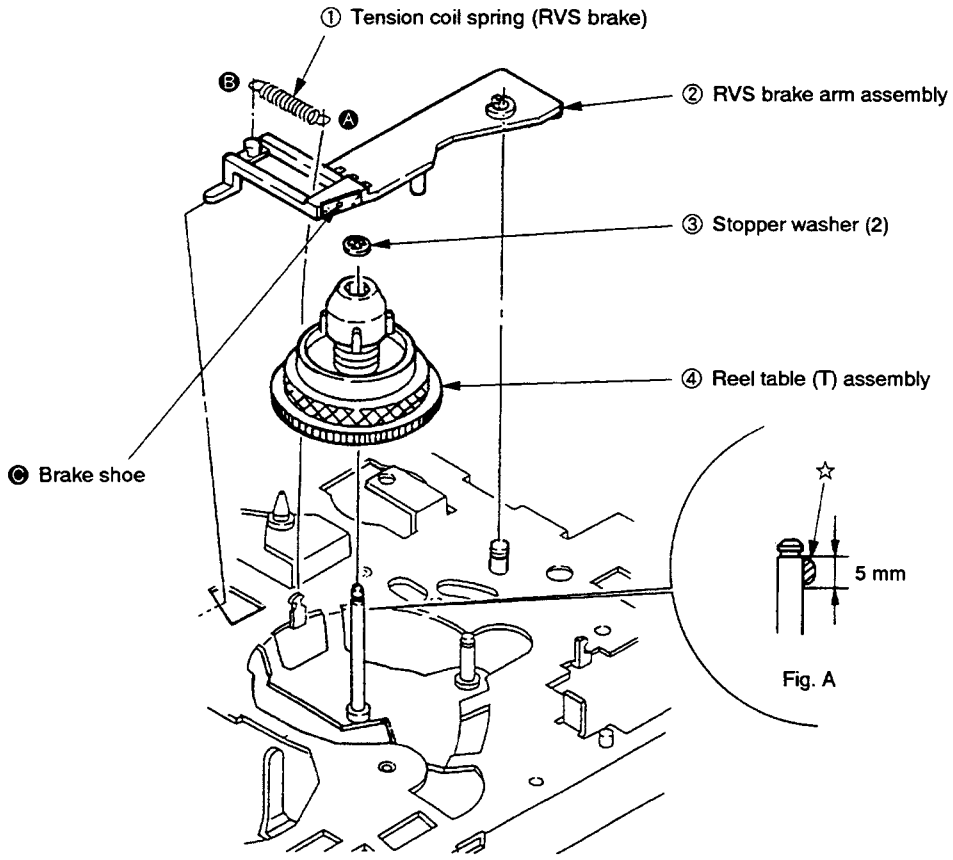


Fig. 3-14

3-13. TG8 ASSEMBLY (Fig. 3-15)

1) Remove TG8 retainer ① to pull out TG8 assembly ②.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG8 retainer ①.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

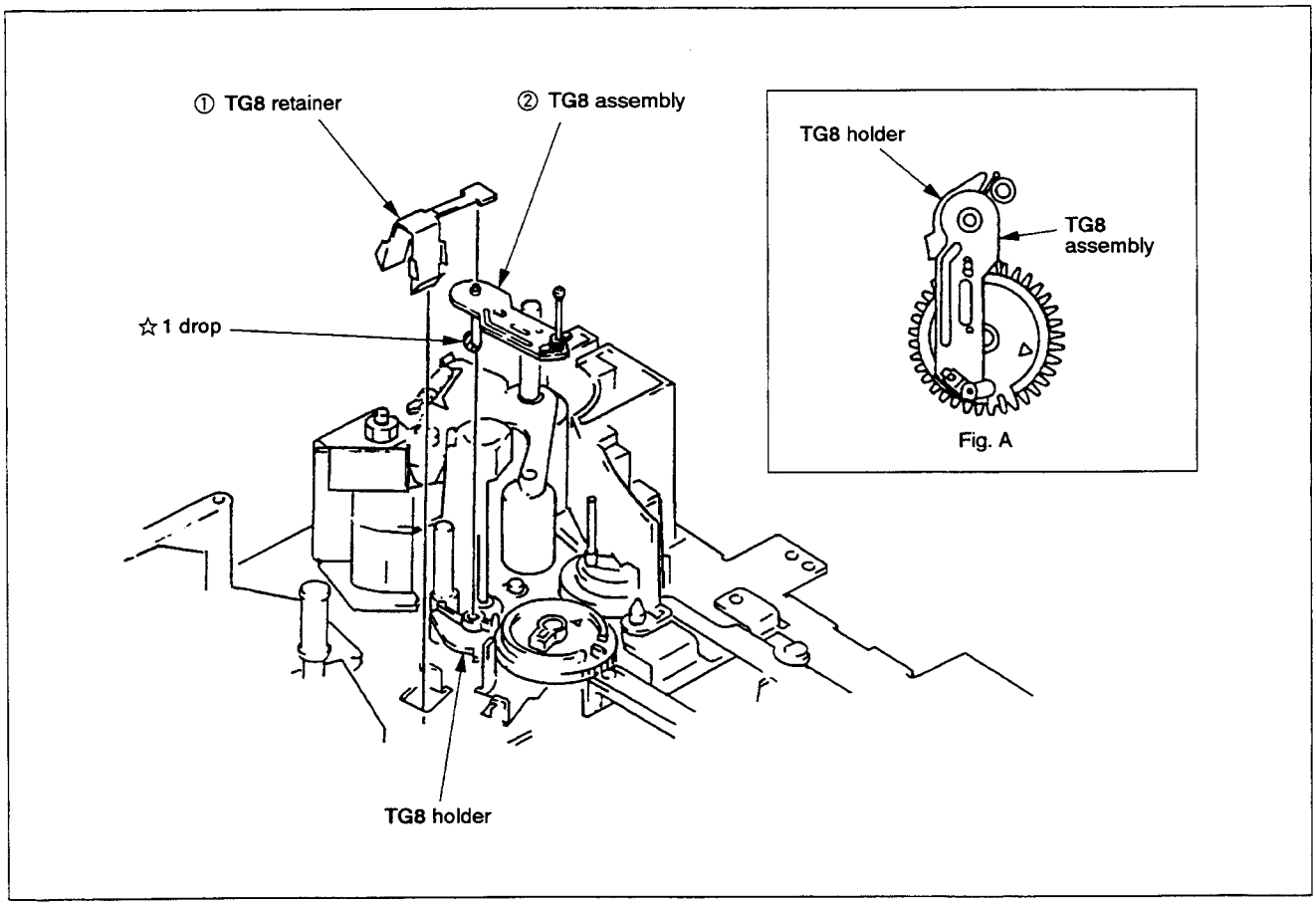


Fig. 3-15

3-14. TG8 HOLDER (Fig. 3-16)

1) Remove TG8 assembly. (Refer to 3-13)
2) Pull out TG8 holder ①.

[Note on Mounting]

- Be careful about the direction of TG8 holder ①. (Ⓐ of Fig. A)

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

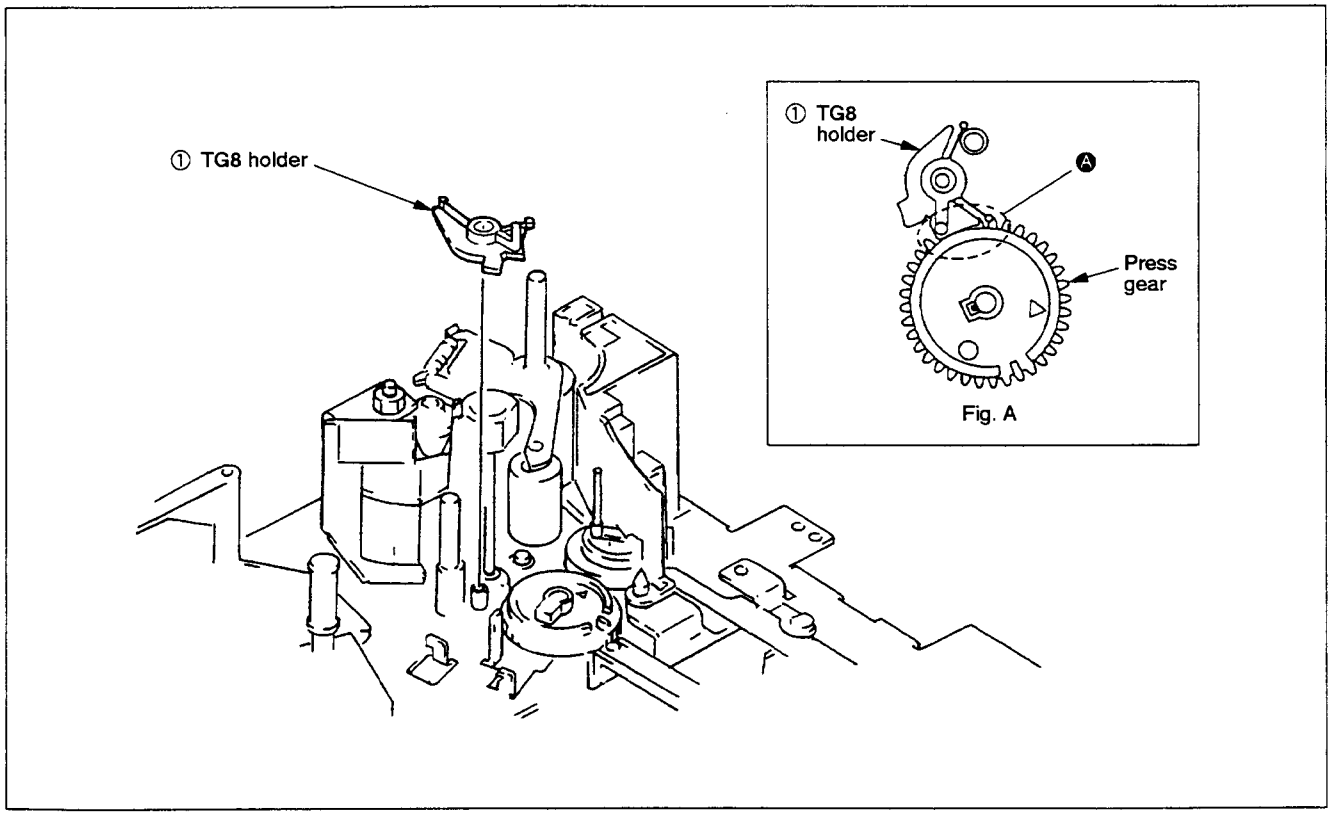


Fig. 3-16

3-15. TG8 AND PRESS GEARS (Fig. 3-17)

1) Remove pinch press block assembly. (Refer to 3-6.)
2) Remove soft brake T assembly. (Refer to 3-11.)
3) Remove TG8 assembly. (Refer to 3-13.)
4) Remove TG8 holder. (Refer to 3-14.)
5) Pull out TG8 gear ① or press gear ②.

[Note on Mounting]

- Adjust the holes on gears to the holes on chassis. (Fig. A)
- Adjust the arrows carved on gears each other. (Fig. A)

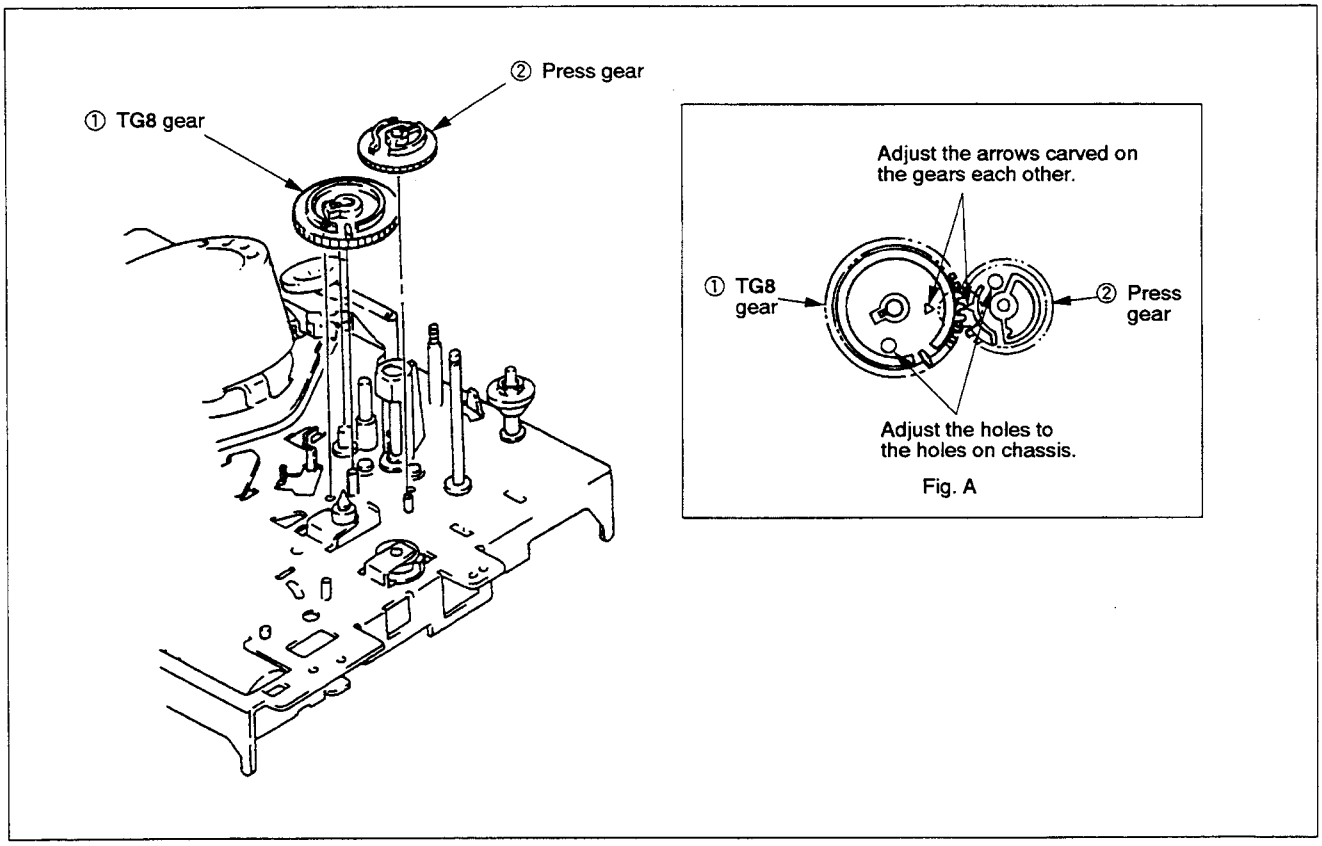

② Press gear
① TG8 gear
Adjust the arrows carved on the gears each other.
① TG8 gear
② Press gear
Adjust the holes to the holes on chassis.
Fig. A

Fig. 3-17

3-16. CAM MOTOR CHASSIS BLOCK ASSEMBLY, UPPER/LOWER COMMUNICATION GEAR (Fig. 3-18)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove screws ① to remove cam motor chassis assembly ②.
4) Pull out upper/lower communication gear ③.

[Note on Mounting]

- First, check main slider ④ slides fully in the arrow Ⓔ direction.
- Set rotary encoder switch position to "E" seen from the window of cam motor chassis. (Fig. A)
- Tighten screws ① in the order Ⓐ to Ⓑ to Ⓒ to Ⓓ.

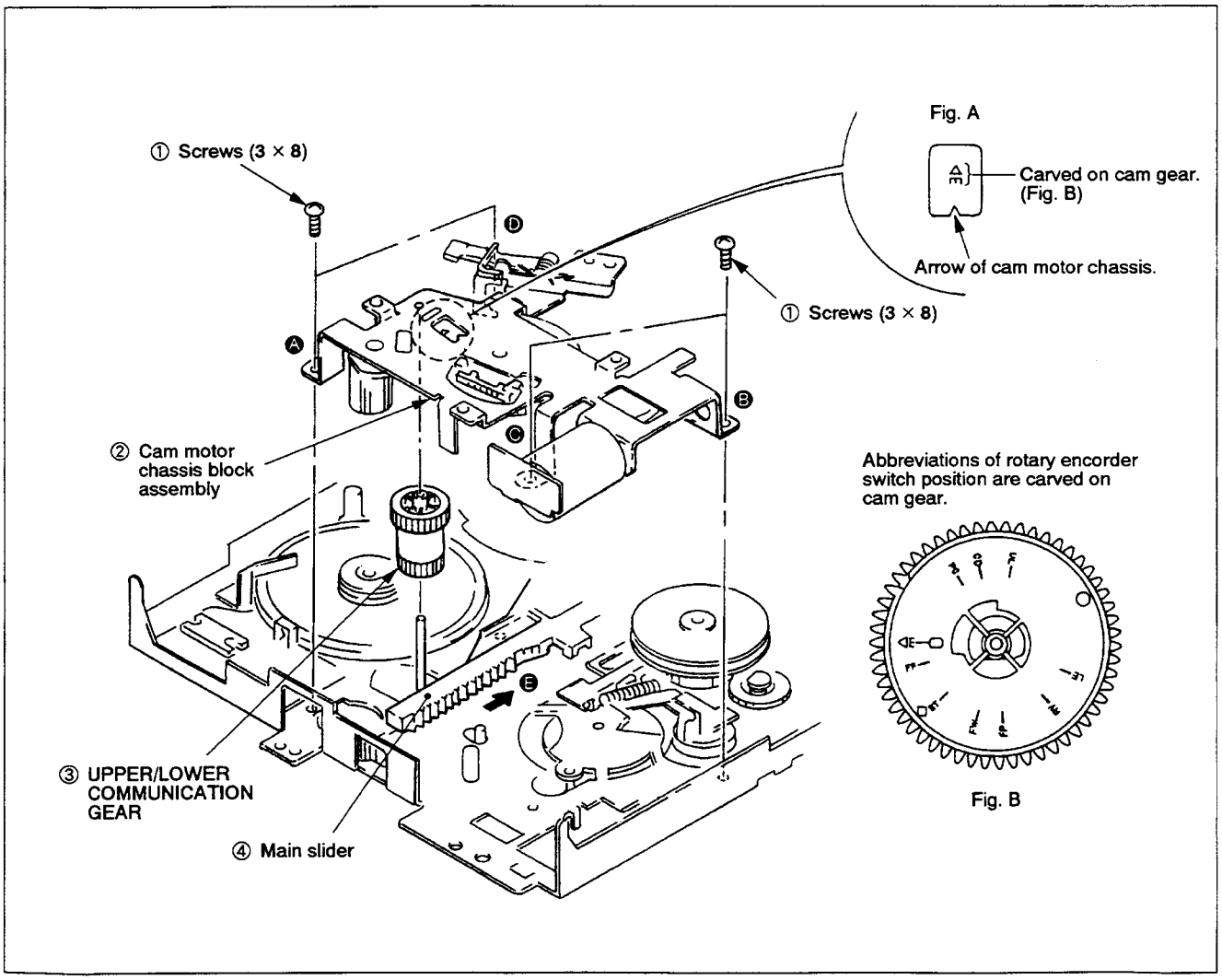


Fig. 3-18

3-17. ROTARY ENCODER SWITCH (Fig. 3-19)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly (Refer to 3-15.) and turn upside on the bottom.
4) Remove stopper washer (2) ① to pull out worm wheel ②.
5) Remove stopper washer (2) ③ to pull out cam gear ④.
6) Pull out FL driving gear ⑤ and rotary encoder switch ⑥.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions. (Fig. 3-19, A)
- Adjust the hole Ⓐ to the hole on cam motor chassis. (Fig. B)
- Adjust the holes Ⓑ and Ⓒ to the hole on cam motor chassis. (Fig. C)

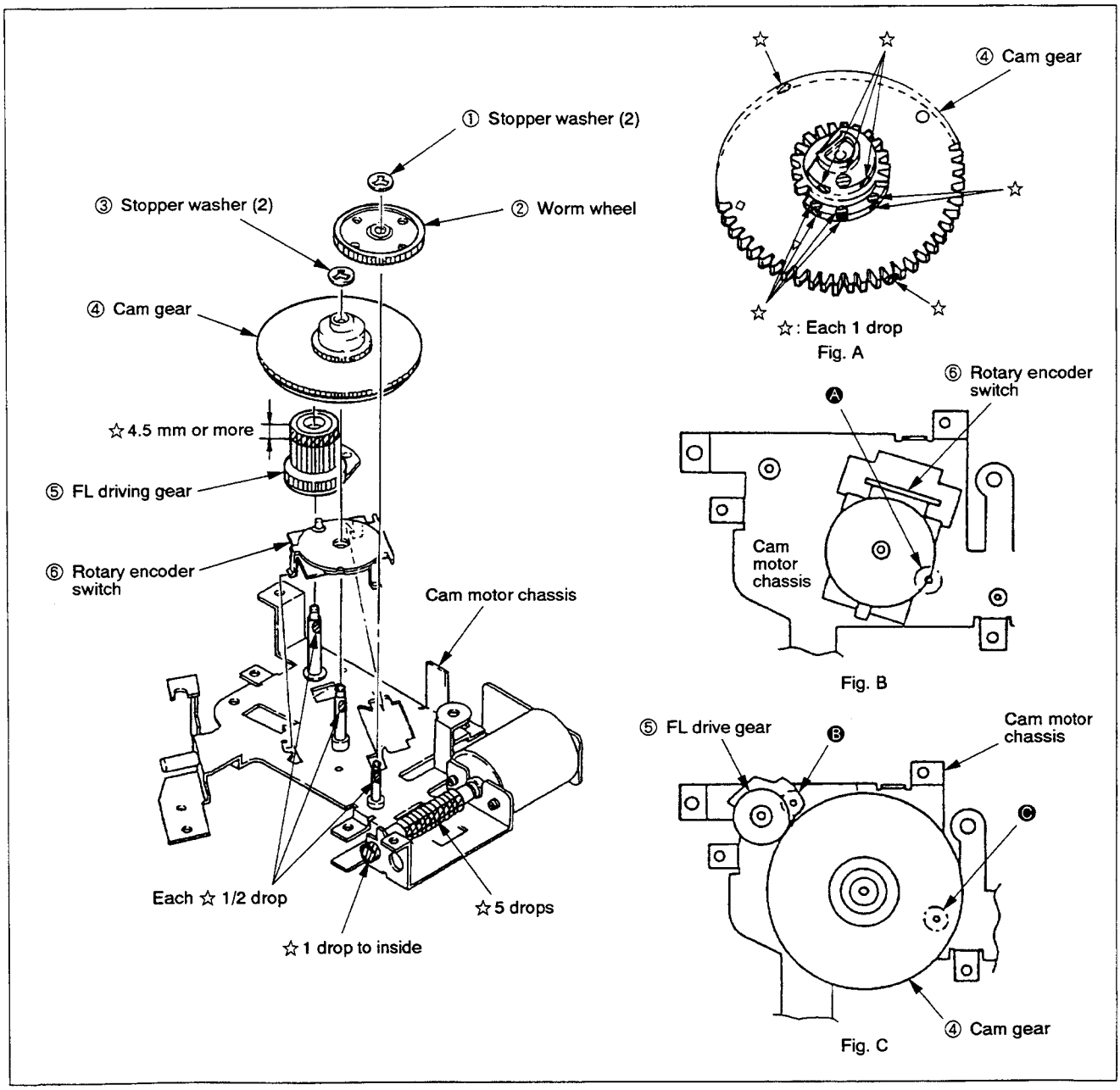


Fig. 3-19

3-18. MAIN SLIDER (Fig. 3-20)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove screw ① to remove retainer ②.
5) Pull out main slider ③.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) as shown in Fig. A.
- At the last, slide main slider fully in the arrow Ⓐ direction.

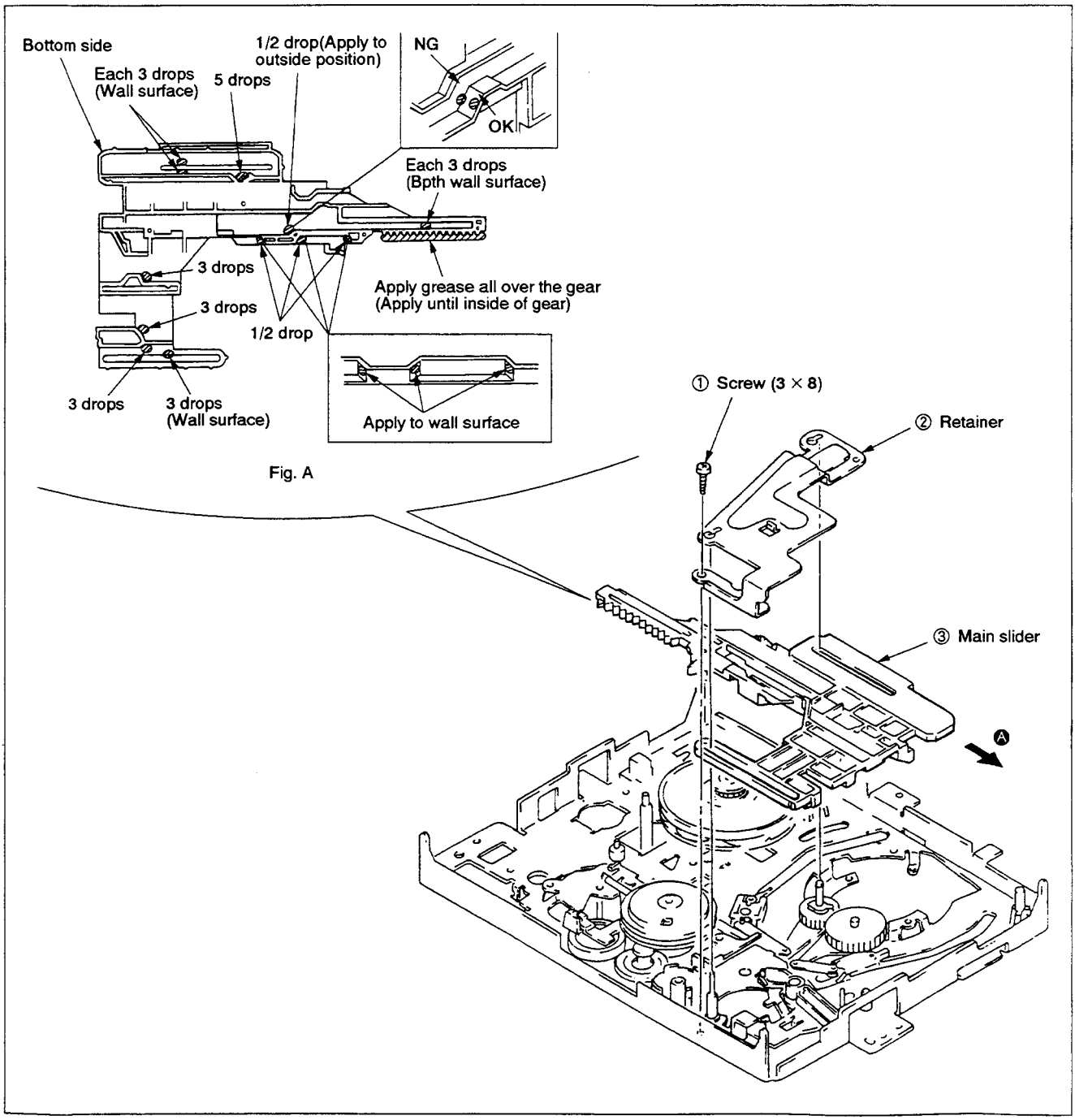


Fig. 3-20

3-19. SHUTTLE T BLOCK AND LOADING GEAR T BLOCK ASSEMBLIES (Fig. 3-21)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove screw ① to remove loading leaf (T) spring ② and shuttle T block assembly ③.
6) Pull out loading gear T block assembly ④.

[Note on Mounting]

- Adjust the phase Ⓐ between loading gear (T) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle T block assembly ③.

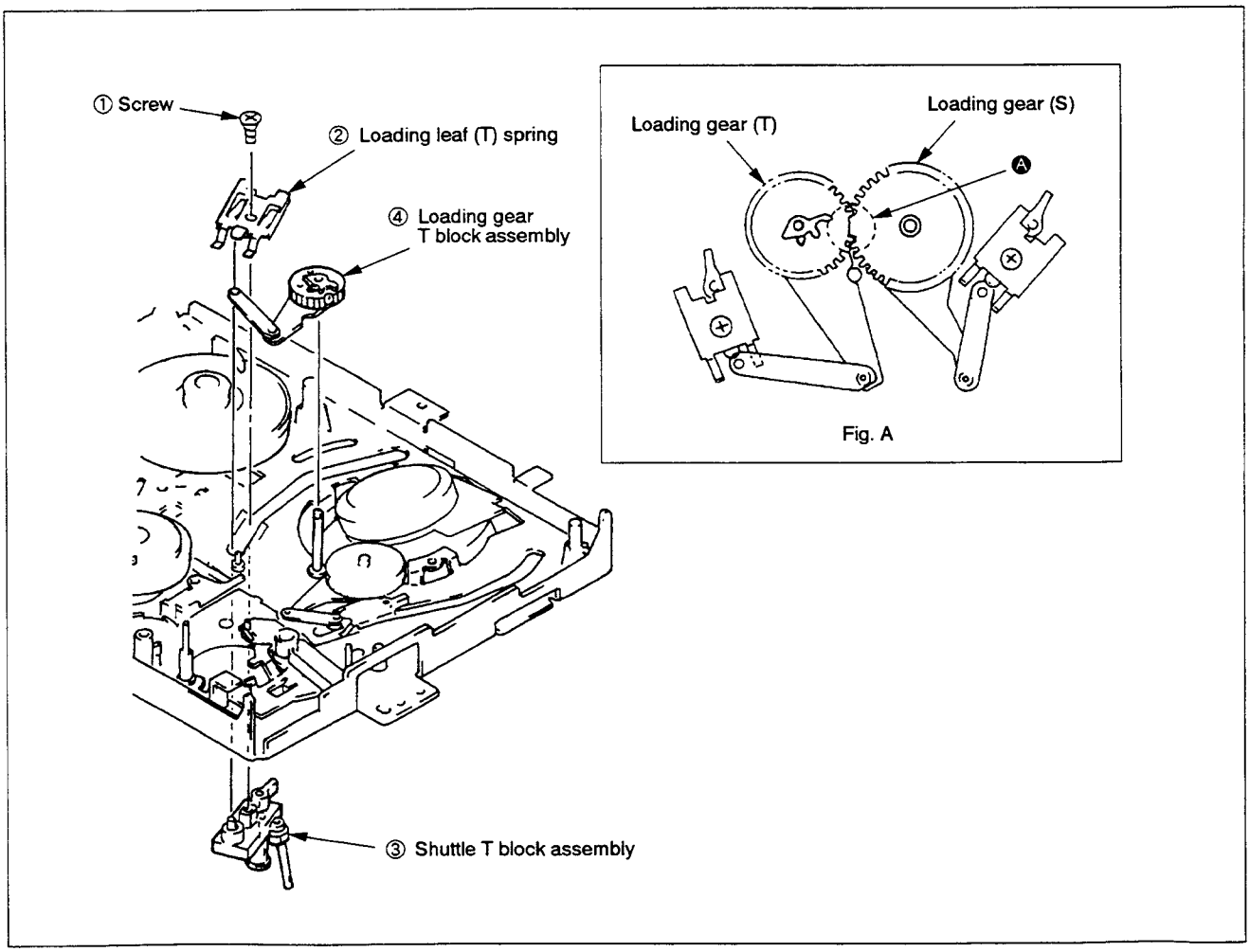


Fig. 3-21

3-20. SHUTTLE S BLOCK AND LOADING GEAR S BLOCK ASSEMBLIES (Fig. 3-22)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-15.)
5) Remove screw ① to remove loading leaf (S) spring ② and shuttle S block assembly ③.
6) Pull out loading gear S block assembly ④.

[Note on Mounting]

- Adjust the phase Ⓐ between loading gear (S) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle S block assembly ③.

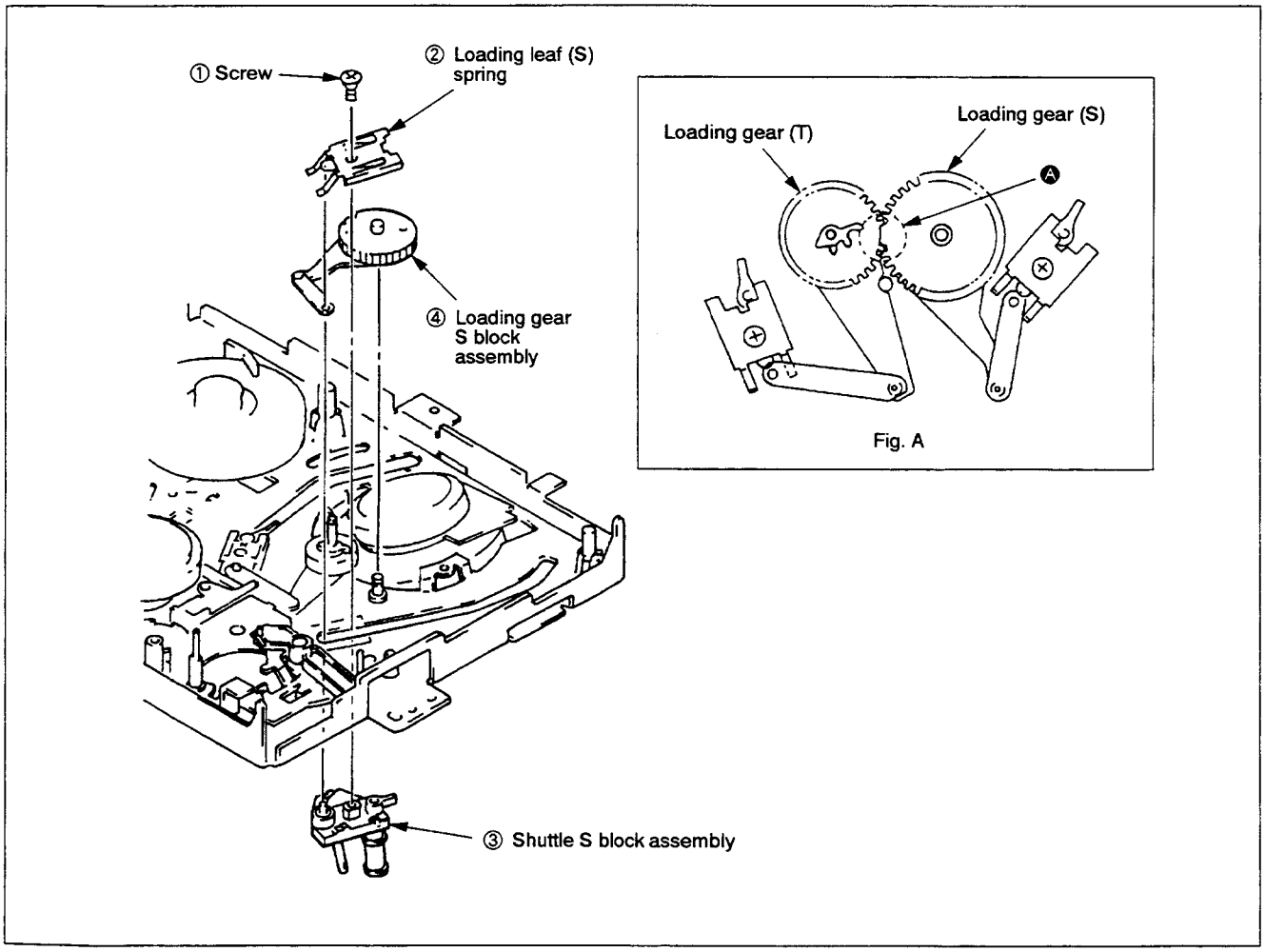


Fig. 3-22

3-21. REEL TABLE (S) ASSEMBLY (Fig. 3-23)

1) Remove tension spring ① from the chassis side.
2) Remove stopper washer (2) ② to pull out soft brake (S) ③.
3) Move TG1 band ④ over the reel table.
4) Remove stopper washer (2) ⑤.
5) While pressing main brake S assembly ⑥, pull out reel table (S) assembly ⑦.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (S) assembly ⑥. (Fig. A)
- Don't touch the hatched portion on reel table (S) assembly ⑥ with bare hand.

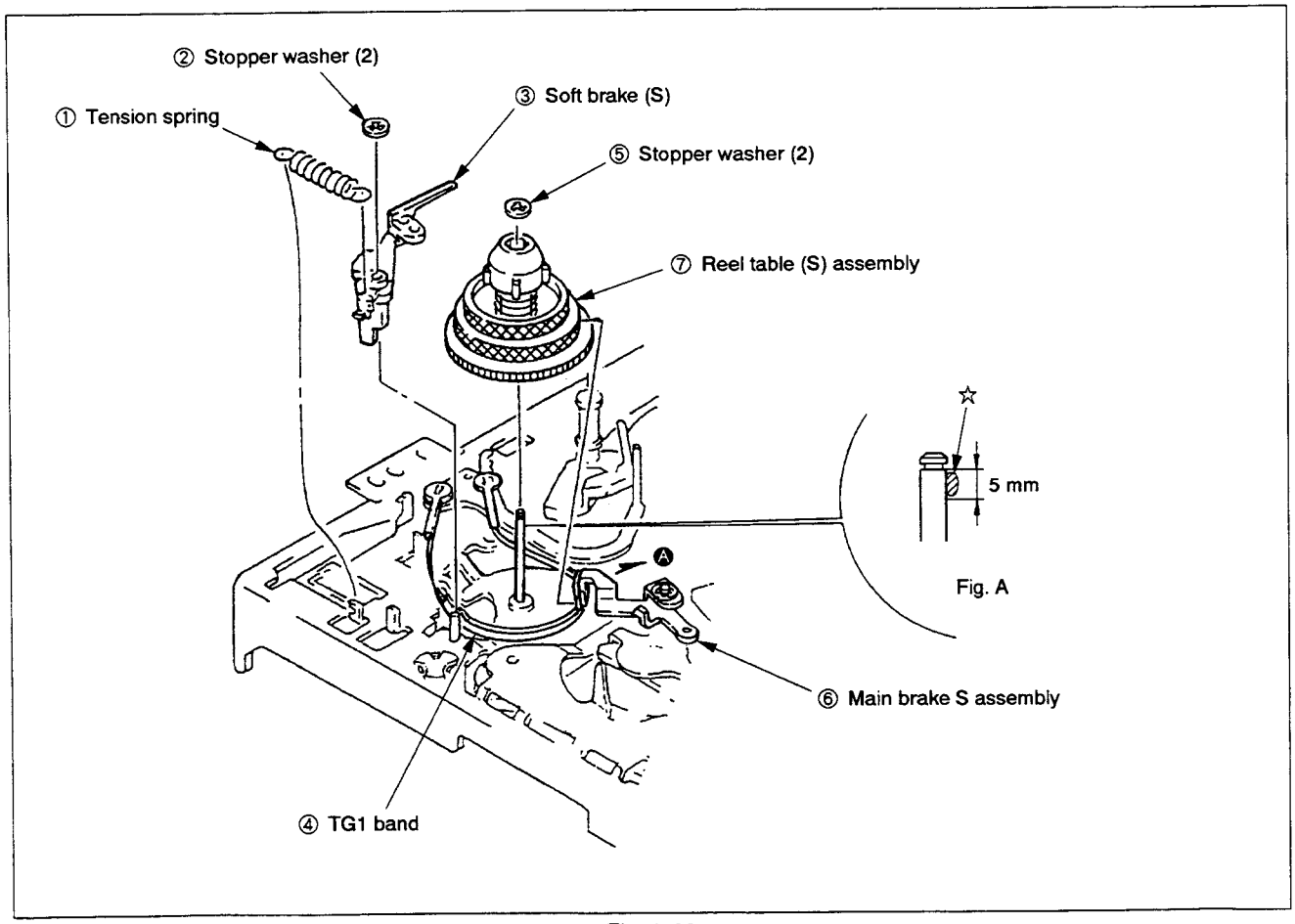


Fig. 3-23

3-22. TG1 ASSEMBLY (Fig. 3-24)

1) Set the mechanism to the loading-end condition referring to 1-1. (Cam gear indicates "LE". (Refer to Fig. A and B of Fig. 3-18.))
2) Remove tension spring ① in the order Ⓐ to Ⓑ.
3) Remove stopper washer (2) ② to pull out TG1 assembly ③.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion.
- Keep clean the felt side of TG1 assembly.

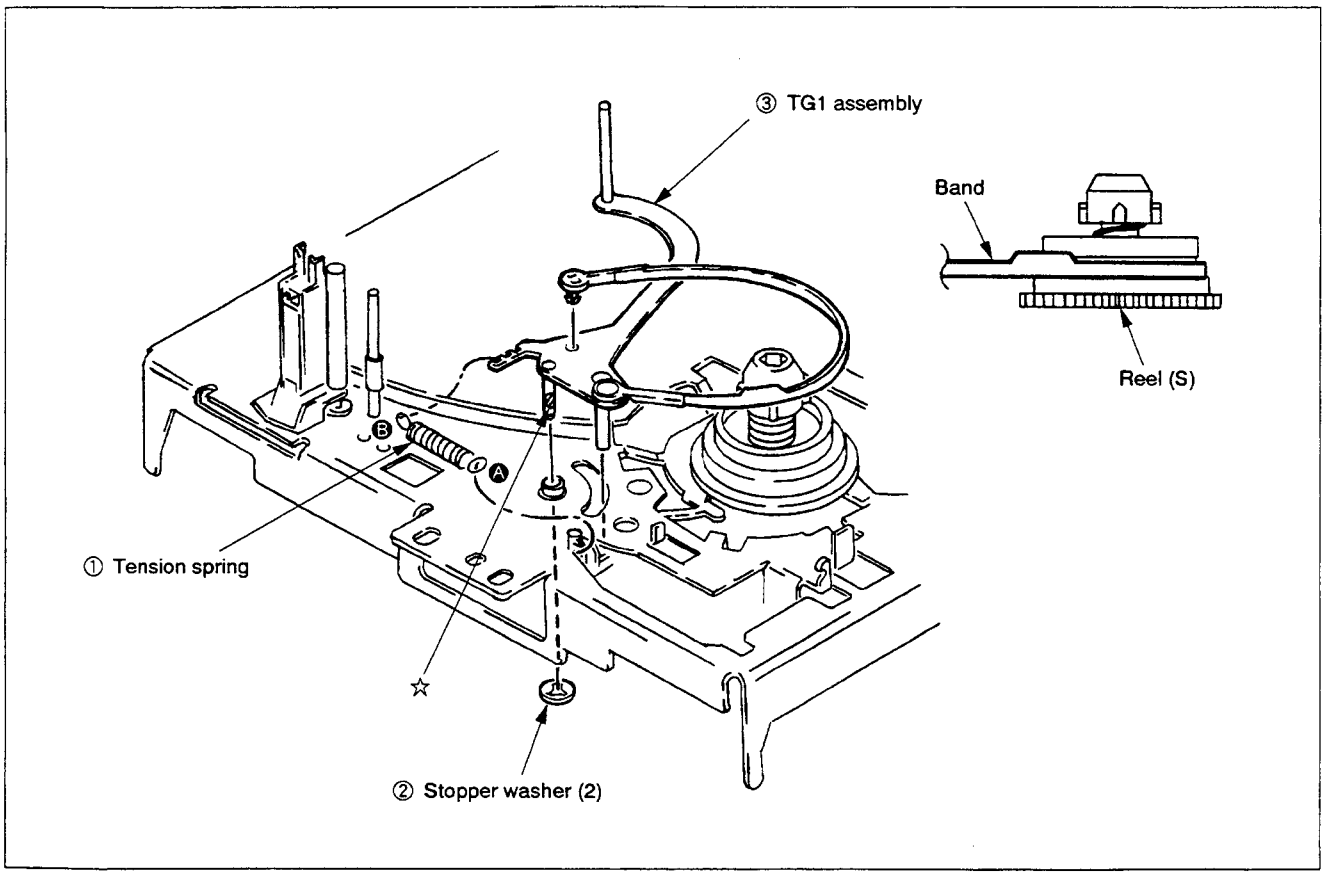


Fig. 3-24

3-23. S WINDING BLOCK ASSEMBLY (Fig. 3-25)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove stopper washer (2) ① to pull out S winding block assembly ②.
6) Remove torsion spring ③.

[Note on Mounting]

- At the last, hang torsion spring ② to the position Ⓐ.
- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.

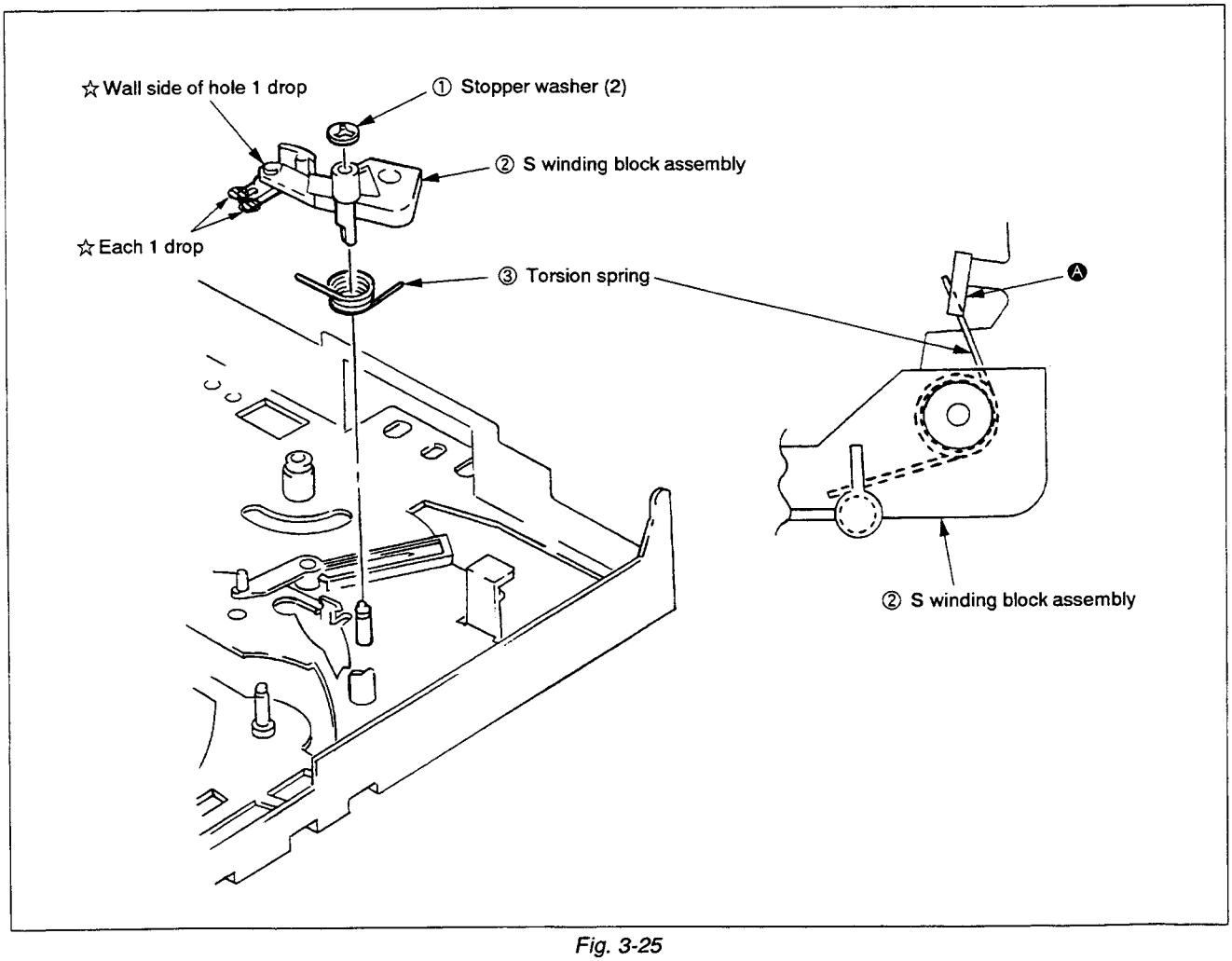


Fig. 3-25

3-24. TRIGGER LEVER AND RKB BLOCK ASSEMBLIES (Fig. 3-26)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove tension spring ① in the order Ⓐ to Ⓑ to remove trigger lever assembly ②.
6) Remove screws (3 × 8) ③ to remove RKB block assembly ④.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions on trigger lever assembly. (Fig. A)

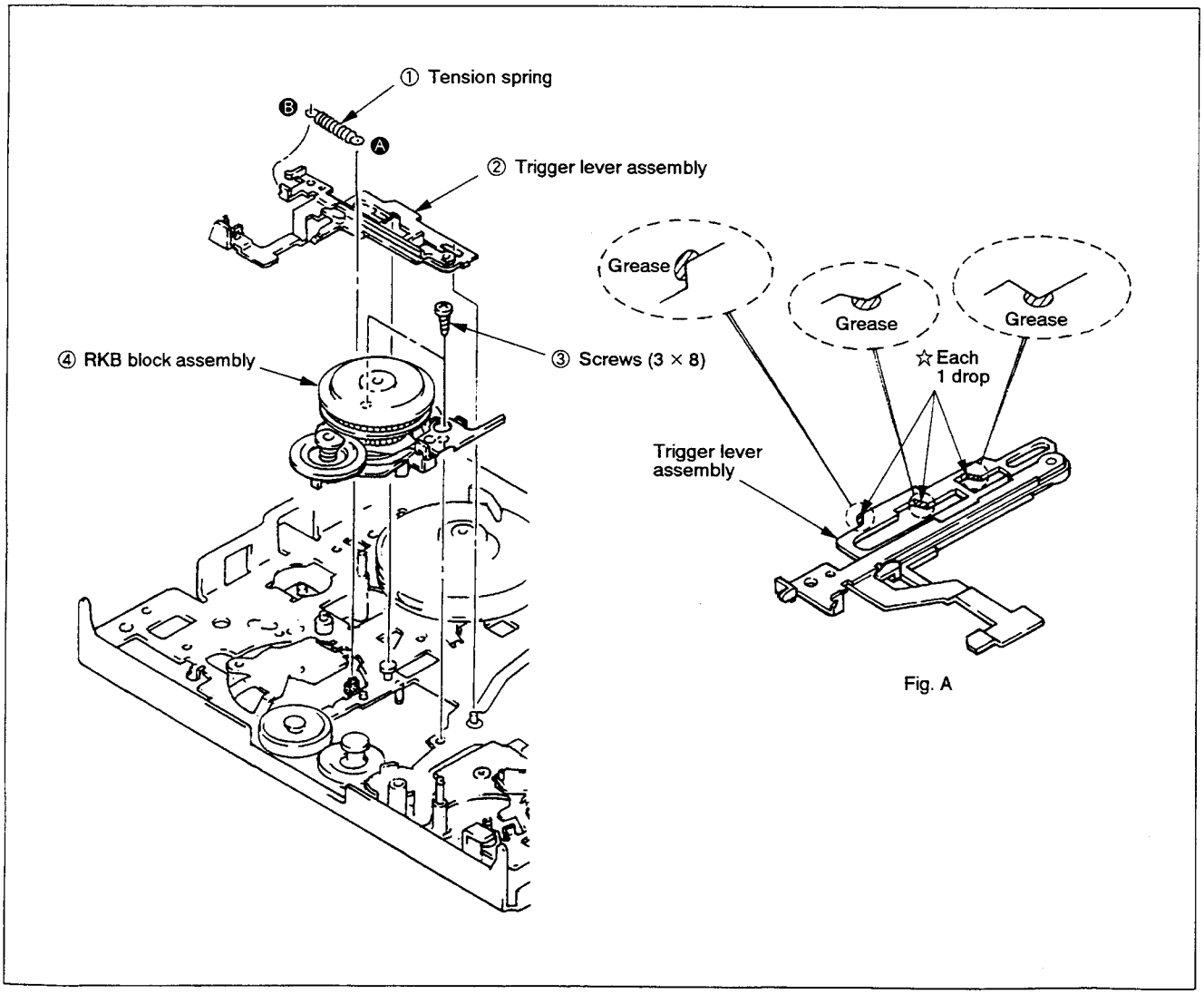


Fig. 3-26

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.
Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.
The tape path system is factory preadjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

Purpose: stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

• Position adjustment

Mode	Treading is completed without a cassette loaded
Adjustment locations	Eccentric pin of TG1 band assembly

[Adjustment Method]

1) Allow the unit to go through the threading procedure without a cassette loaded.
2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

• Tension adjustment

Mode	Playback
Measuring instrument/tool	Torque cassete
Adjustment locations	Position for hooking the tension spring
Specified value	36 to 44 g•cm

[Adjustment Method]

1) Playback the torque cassette.
2) Check that the center value deviation reading on the torque cassette meets with the standards.
3) When the reading is higher than the standards: Move the spring toward direction Ⓐ.
   When the reading is less than the standards: Move the spring toward direction Ⓑ.

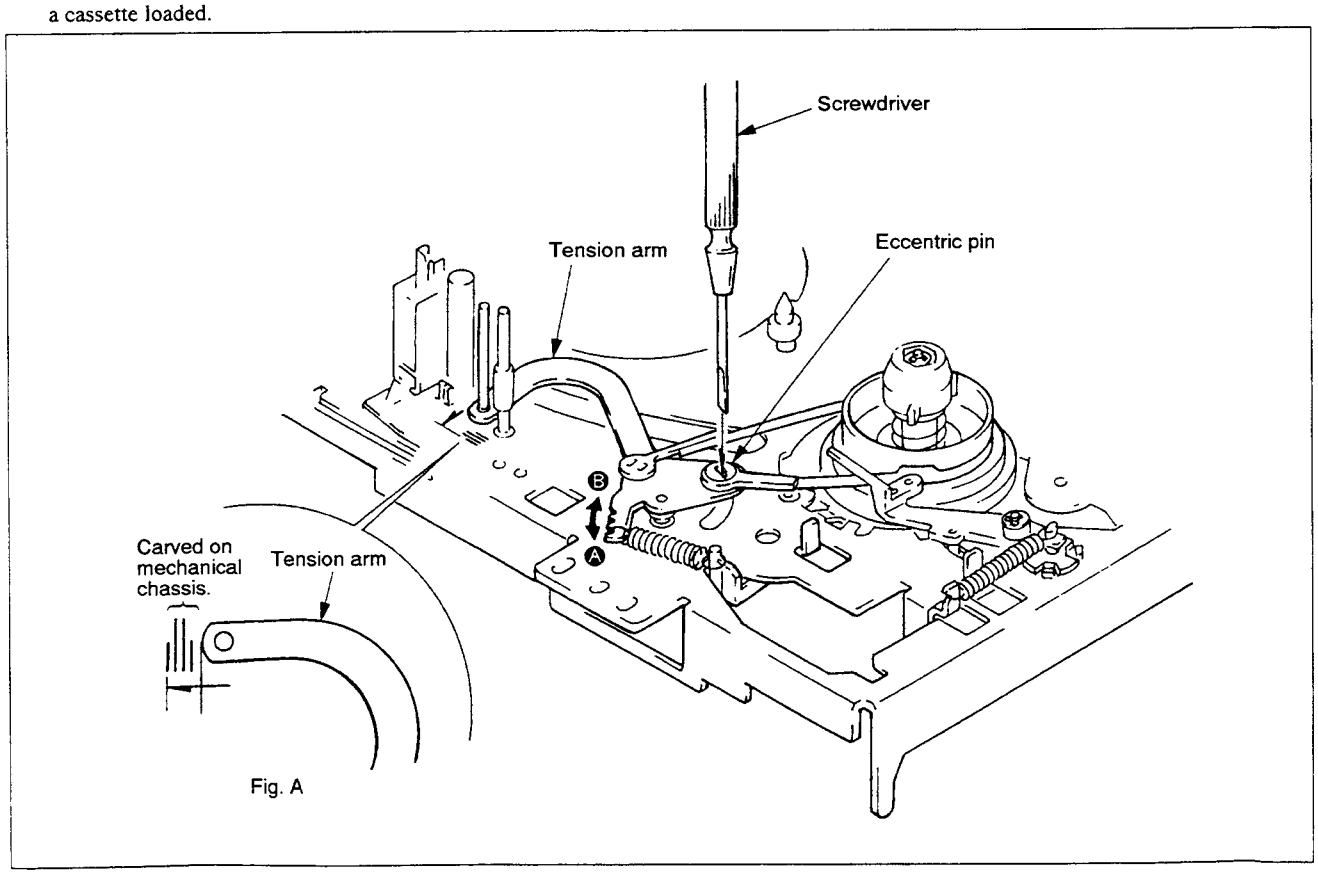


Fig. 4-1

4-1-2. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Fig. 4-2)

Mode	Playback
Jig	Blank tape
Adjustment locations	Guide roller height adjustment screw
Specified value	0 to 0.1 mm

Procedure:

1) Set the tape, during CUE playing back, check the height from lower flange of TG7 to the running tape. (Fig. A)
2) During REV playing back, check the height from lower flange of TG7 to the running tape. (Fig. B)
3) When the difference between items 1) and 2) doesn't go to specified value, adjust by turning TG8 guide roller height adjustment screw.
4) Check the tape is creased or not between the capstan and TG8, adjust with TG8 guide roller height adjustment screw so that the tape is not creased during normal playback, CUE and REV.

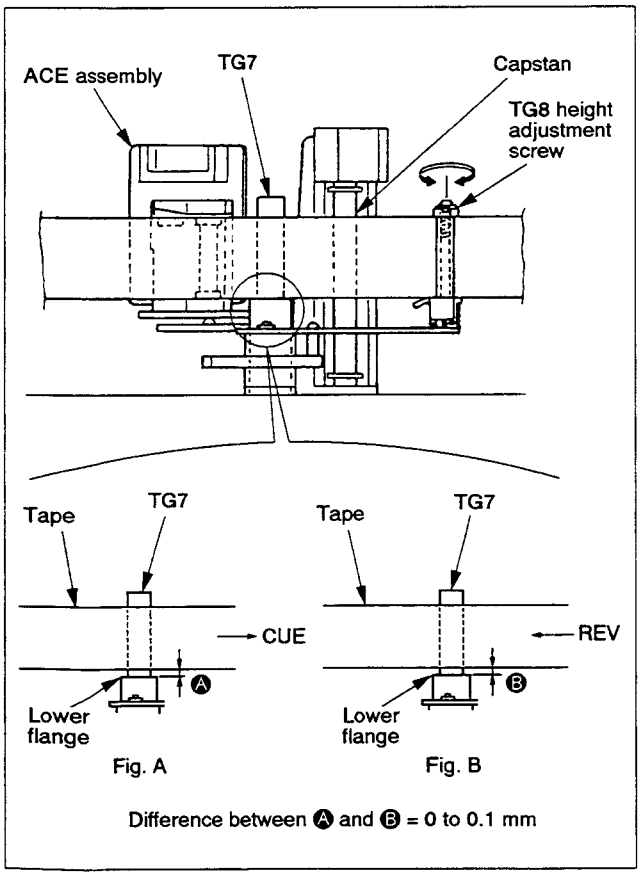


Fig. 4-2

4-1-3. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6 (Fig. 4-3)

Mode	Playback
Signal	Alignment tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller height adjuster screw

[Adjustment Method]

1) Tracking (playback): Turn off the auto tracking, then press the tracking buttons ▽ and △ simultaneously to set the tracking at the center position.
   (If adjustment is made after the drum is replaced, the tracking must be set at the max. RF output position.)
2) Height adjuster screw: Even out the RF output waveforms.
3) Press the tracking buttons (playback), ▽ and △ alternately.
4) Check that RF output drops the same amount at the front and rear edges.

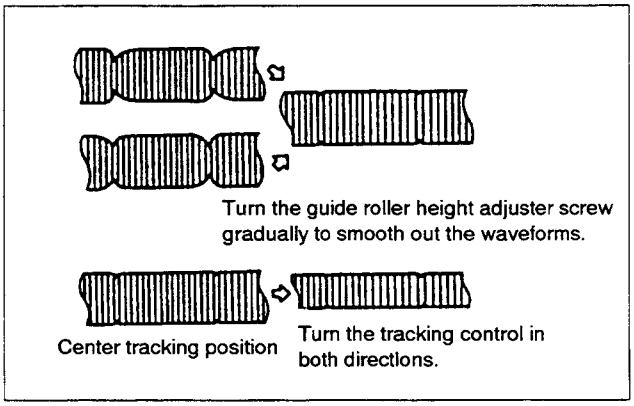

Turn the guide roller height adjuster screw gradually to smooth out the waveforms.
Center tracking position
Turn the tracking control in both directions.

Fig. 4-3

4-1-4. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 4-4 and 4-5)

Purpose: Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Tool	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw, the azimuth adjuster screw and the height adjuster nut.
   (The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

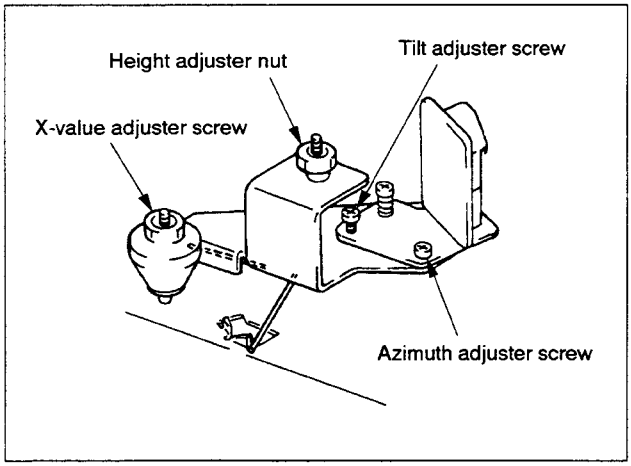


Fig. 4-4

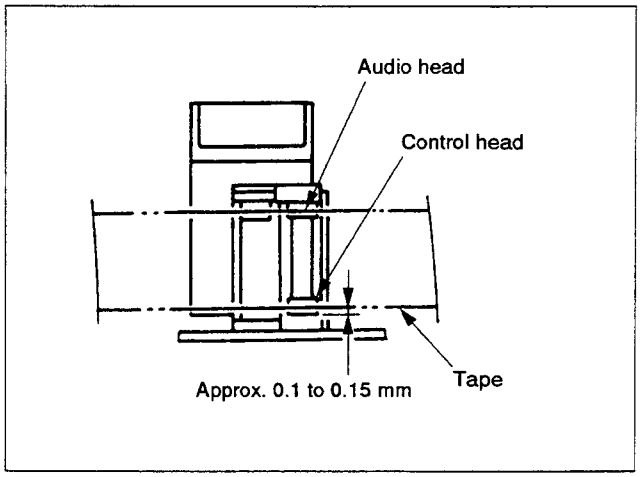


Fig. 4-5

4-1-5. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (1kHz track)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

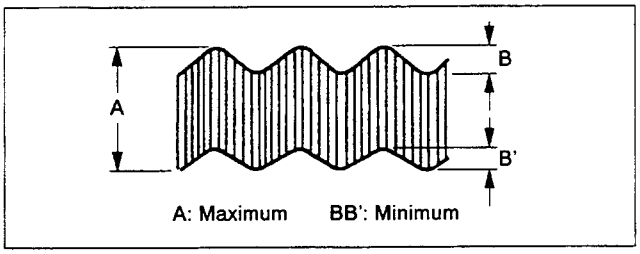


Fig. 4-6

4-1-6. X-VALUE ADJUSTMENT

Purpose: To obtain compatibility with other VTR

Precaution: Be sure to perform the preset tracking adjustment before perform this adjustment. (Refer to the Service Guide.)
Turn off the auto tracking and set the VTR for manual tracking mode.

Mode	Playback
Signal	Alignment tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	X-value adjuster screw

[Adjustment Method]

- **Adjustment by Hi-Fi alignment tape (NTSC only)**
  When the tracking is set at the center position (by pressing the ▽ and △ keys simultaneously), adjust the RF output to maximum.

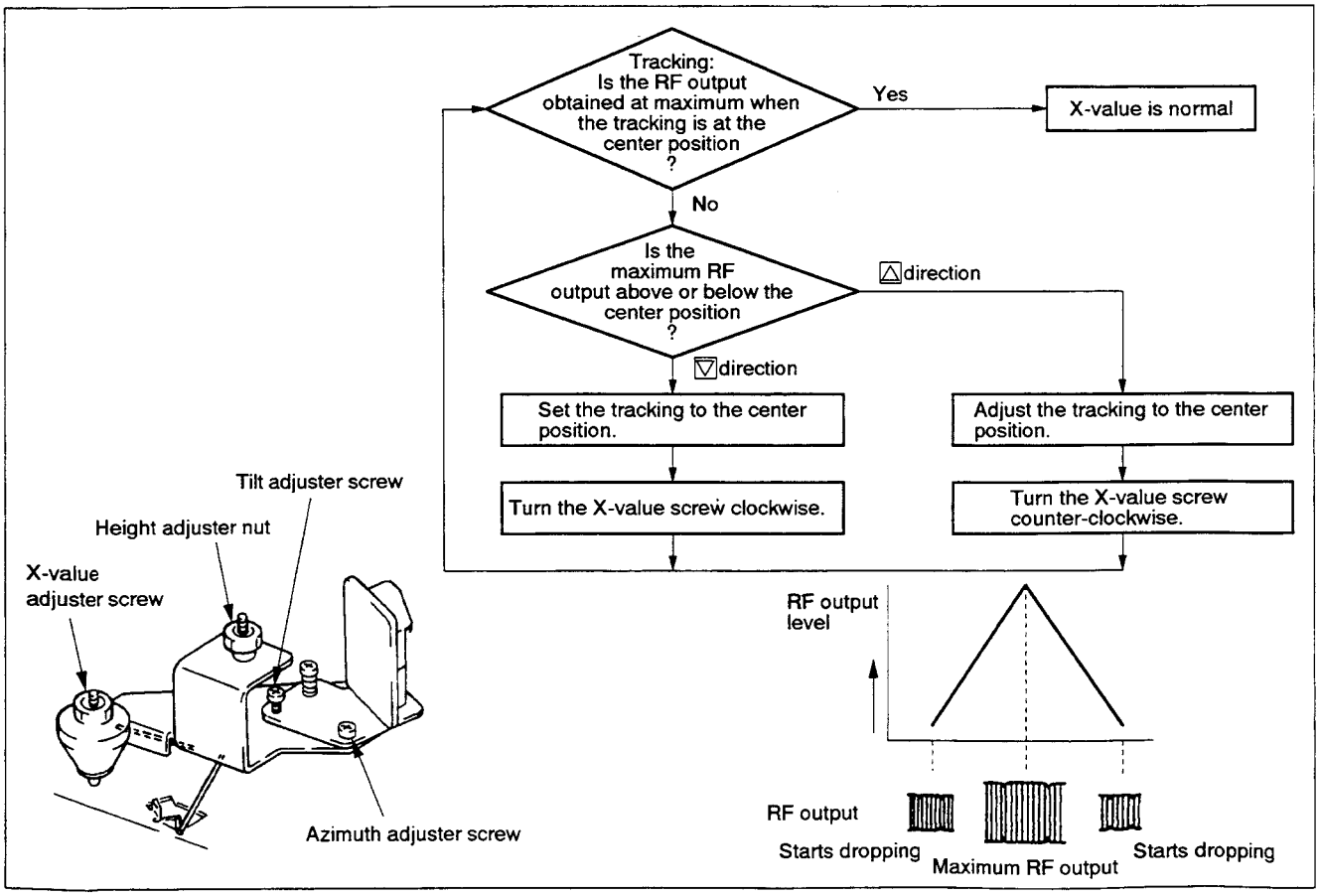

Tracking:
Is the RF output obtained at maximum when the tracking is at the center position ?
Yes
X-value is normal
No
Is the maximum RF output above or below the center position ?
△direction
▽direction
Set the tracking to the center position.
Adjust the tracking to the center position.
Turn the X-value screw clockwise.
Turn the X-value screw counter-clockwise.
Tilt adjuster screw
Height adjuster nut
X-value adjuster screw
Azimuth adjuster screw
RF output level
RF output
Starts dropping
Maximum RF output
Starts dropping

Fig. 4-7

- **Adjustment by alignment tape**

  Adjust the X-value adjuster screw so that maximum RF output is obtained and also that the RF output drops to the same position on pressing the respective ▽ and △ buttons while the tracking is set at the center position.

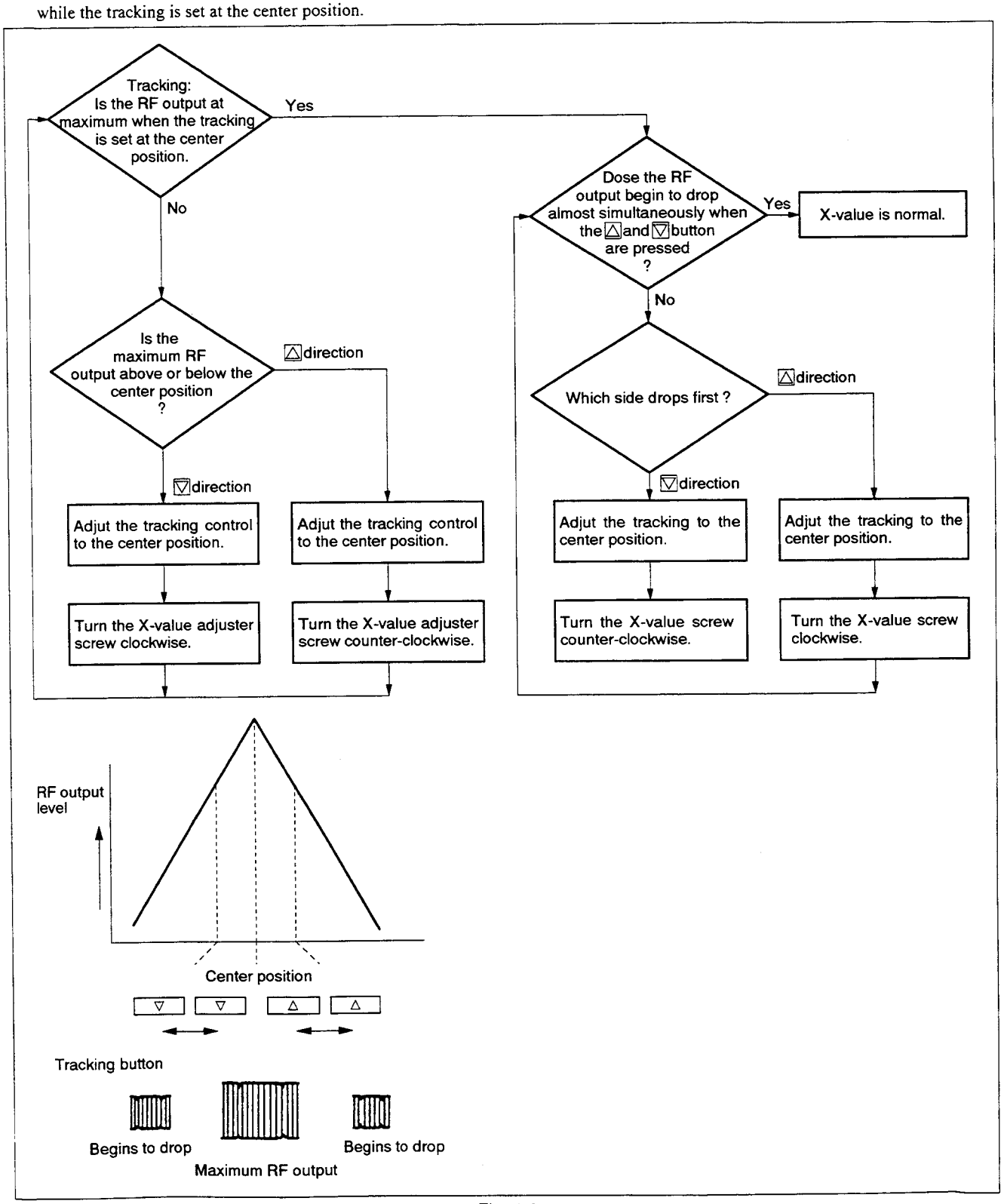

Tracking: Is the RF output at maximum when the tracking is set at the center position.
Yes
No
Dose the RF output begin to drop almost simultaneously when the △ and ▽ button are pressed ?
Yes
X-value is normal.
No
Is the maximum RF output above or below the center position ?
△direction
▽direction
Which side drops first ?
△direction
▽direction
Adjut the tracking control to the center position.
Adjut the tracking control to the center position.
Adjut the tracking to the center position.
Adjut the tracking to the center position.
Turn the X-value adjuster screw clockwise.
Turn the X-value adjuster screw counter-clockwise.
Turn the X-value screw counter-clockwise.
Turn the X-value screw clockwise.
RF output level
Center position
▽ ▽ △ △
Tracking button
Begins to drop
Maximum RF output
Begins to drop

Fig. 4-8

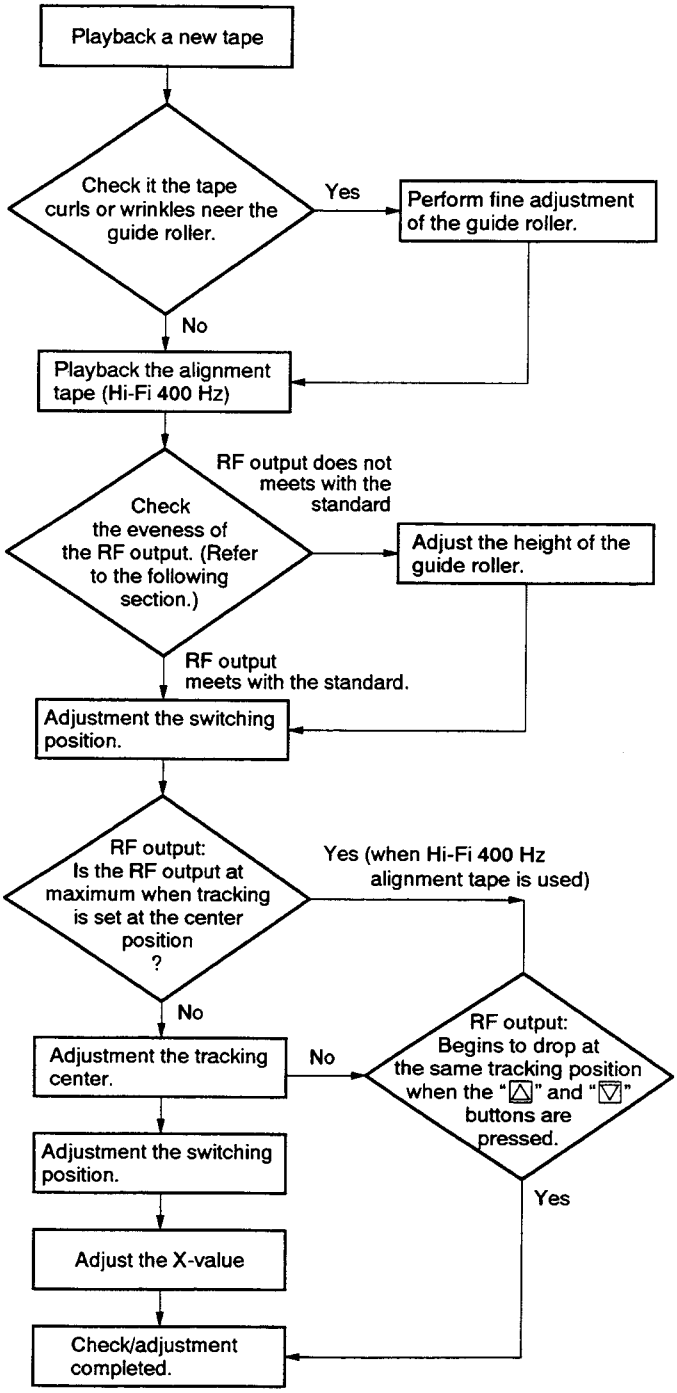
4-1-7. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Precaution: Turn off the auto tracking and set the manual tracking mode.

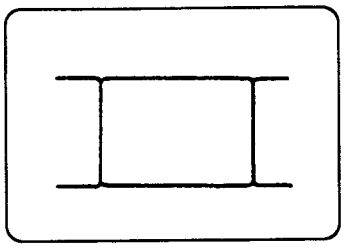
Mode	Playback
Signal	Alignment tape, blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller (refer to 4-1-2, 4-1-3.) Switching position, Tracking preset, SP delay mono-multi (Refer to the Service Manual), X-value. (refer to 4-1-6.)

[Adjustment Method]

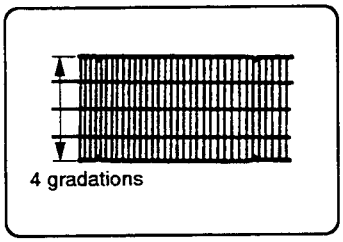

Playback a new tape
Check it the tape curls or wrinkles neer the guide roller.
Yes
Perform fine adjustment of the guide roller.
No
Playback the alignment tape (Hi-Fi 400 Hz)
Check the eveness of the RF output. (Refer to the following section.)
RF output does not meets with the standard
Adjust the height of the guide roller.
RF output meets with the standard.
Adjustment the switching position.
RF output: Is the RF output at maximum when tracking is set at the center position ?
Yes (when Hi-Fi 400 Hz alignment tape is used)
No
Adjustment the tracking center.
No
RF output: Begins to drop at the same tracking position when the "△" and "▽" buttons are pressed.
Yes
Adjustment the switching position.
Adjust the X-value
Check/adjustment completed.

[Checking the evenness and fluctuation of the RF output]

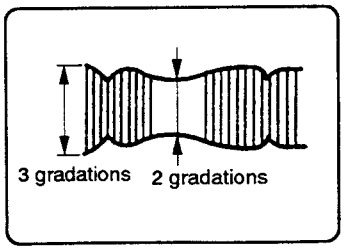
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

4-1-8. CHECKING THE TENSION AND TORQUE

Purpose: To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.

If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode without loading a cassette tape. (Refer to section 1-3.)
Measuring instrument	Torque gauge, Torque gauge adaptor

Item	VTR operation mode	Reel to be measured	Measurement value
Main brake torque	Stop	Supply and take-up reels	170 g•cm or more
Review torque	Review	Supply reel	180 ± 30 g•cm (using the torque cassette)
Take-up torque	Playback	Take-up reel	95 ± 25 g•cm (using the torque cassette)
Back tension torque	Playback	Take-up reel	33 to 44 g•cm (using the torque cassette)

[Check Method]

Measure the torque using the torque gauge and torque gauge adaptor with the torque gauge fixed.

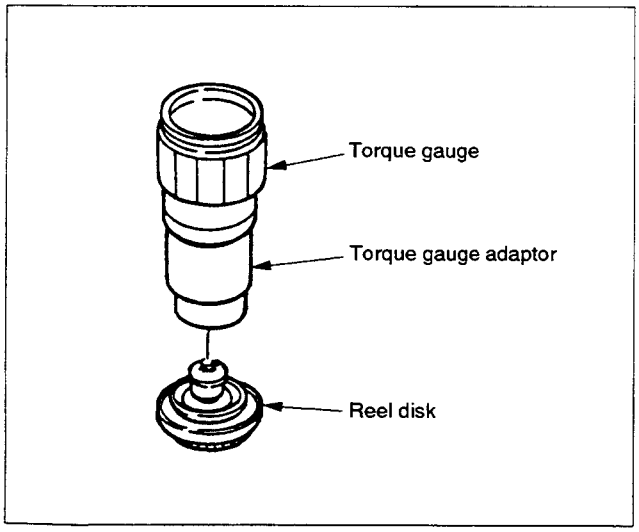


Fig. 4-9

V03056

VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY®
SERVICE MANUAL

H MECHANISM

SUPPLEMENT-1

1. How to Use the Mode Selector II for Adjusting H Type Mechanism Assembly.
2. Adjusting Mechanism Using New Alignment Tape (KRV-52NE For NTSC).

File this supplement with the VHS mechanical adjustment IV.

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MICROFILM

1. HOW TO USE THE MODE SELECTOR II FOR ADJUSTING H TYPE MECHANISM ASSEMBLY

1-1. OUTLINE

To activate the VHS system H type mechanism assembly using mode selector II (J-6082-282-A), use connector conversion jig (J-6090-052-A). By using the connector conversion jig, the following operations are possible.

- Loading and unloading action by the loading motor
- Reading of the current setting of the mode switch
- Normal and reverse rotation of the capstan motor

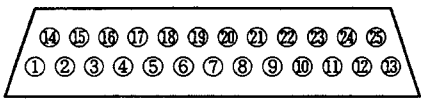
1-2. PREPARATION

1-2-1. ADDITION OF POWER SUPPLY CABLE (Already added Mode Selector II also available)

In order to drive the capstan motor, the power +5 V and +12 V are supplied from the Mode Selector II. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

Supplied 3-pin cable	DSUB connector of the mode selector II	Voltage
Pin 1 (Red index)	Pin 20	+12 V
Pin 2	Pin 25	GND
Pin 3	Pin 24	+5 V

- Connector pin number assignment of the DSUB connector (From the soldering side)



- When connections are made, check that +5 V and +12 V are available at the 3-pin cable connector.

1-2-2. CHECKING THE SOFTWARE VERSION

Turn on the power of the mode selector II.
If the reading for the software version on the mode selector II is not 1.10 or higher, replace the New ROM (J-6082-314-A).

1-3. CONNECTION

1-3-1. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR II (See Fig. 1-1)

Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the mode selector II to the corresponding connectors on the connector conversion jig (J-6090-052-A).

1-3-2. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE H TYPE MECHANISM ASSEMBLY

With the power of the mode selector II turned off, insert the following three connectors to the corresponding connectors on the H type mechanism assembly.

- 3-pin connector for the loading motor
- 5-pin connector for the mode switch
- 8-pin connector for the capstan motor

Set the speed control for the minimum setting (fully counter-clockwise).

1-4. OPERATION

1-4-1. OPERATION OF THE LOADING MOTOR ON THE H TYPE MECHANISM ASSEMBLY

(1) Select the H type mechanism assembly setting on the mode selector II .
(2) After this, procedures are the same as those for the previous model types.
For the operating method, see pages 3 to 5 of "8 mm Video Mechanism Manual VI (TK Mechanism) Supplement-1".
For the loading method, see page 3 of "VHS Mechanical Adjustment Manual IV (H Mechanism)".

1-4-2. OPERATION OF THE CAPSTAN MOTOR ON THE H TYPE MECHANISM ASSEMBLY

(1) For the loading motor operation under Section 1-4-1, change the mode setting to the FF/REW mode with the mode switch.
(2) Turn the speed control gradually in clockwise direction, and the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FWD/RVS setting of the rotating direction switch.

1-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the mode selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the mode selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via foreign conductive materials.

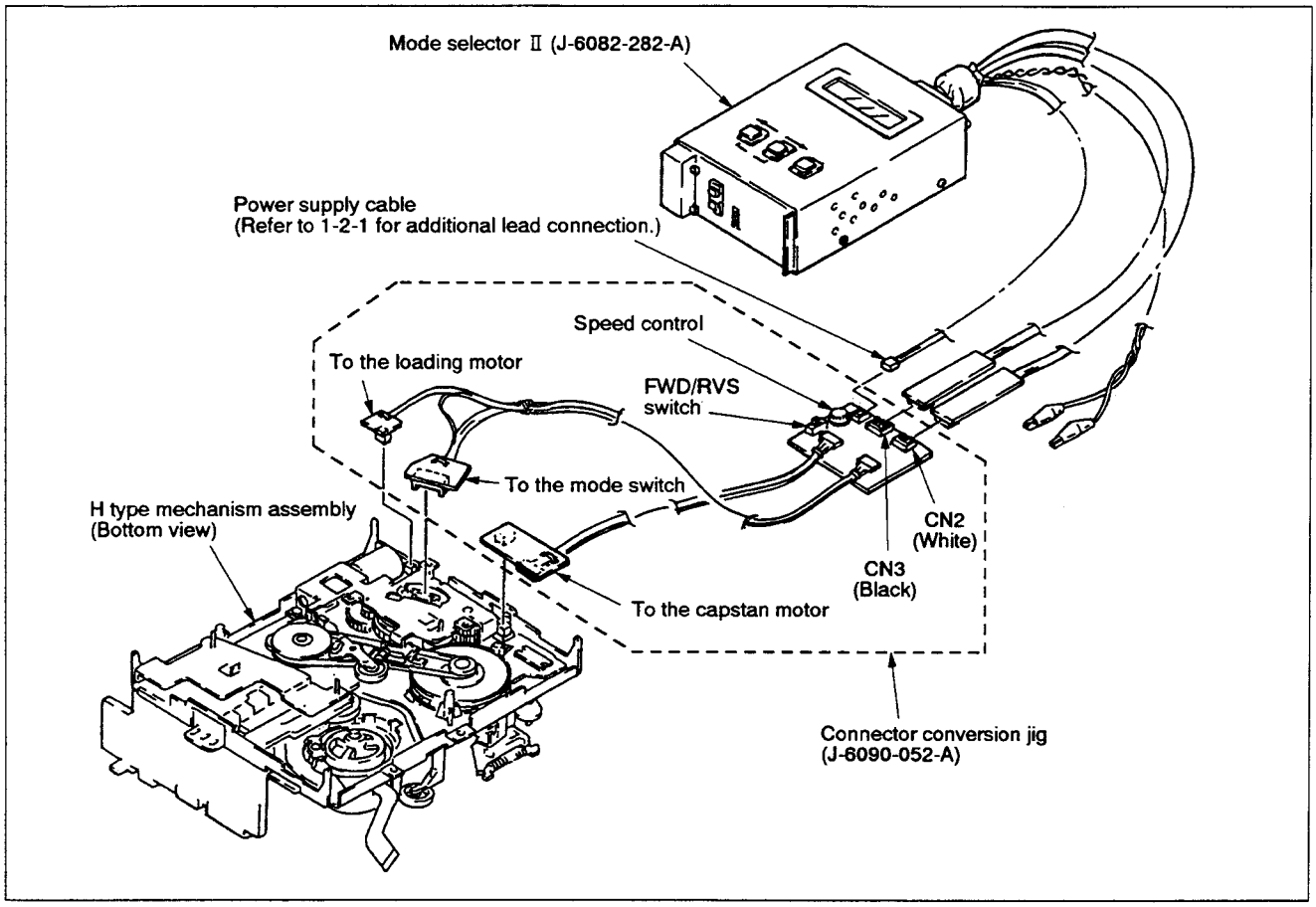

Mode selector II (J-6082-282-A)
Power supply cable
(Refer to 1-2-1 for additional lead connection.)
Speed control
To the loading motor
FWD/RVS
switch
To the mode switch
H type mechanism assembly
(Bottom view)
CN2
(White)
CN3
(Black)
To the capstan motor
Connector conversion jig
(J-6090-052-A)

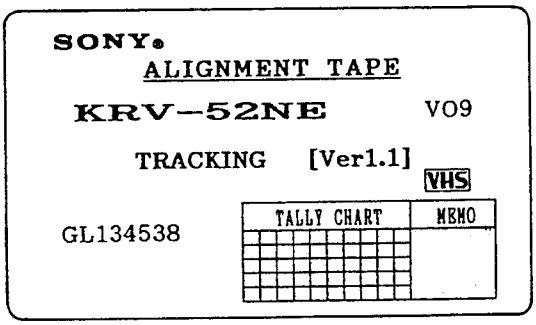
Fig. 1-1

2. ADJUSTING THE MECHANISM USING NEW ALIGNMENT TAPE (KRV-52NE for NTSC)

The conventional alignment tape (For NTSC) is now replaced with alignment tape KRV-52NE, and the following describes how to align the mechanism using the KRV-52NE. For details on the use of KRV-51N2 for each model, refer to the service manuals which will be issued in the future.

Name	Parts No.	Remarks
Alignment tape KRV-52NE for NTSC	8-192-605-41	For tape path, audio azimuth, and X-value adjustments
Alignment tape KRV-51N2 for NTSC	8-192-605-32	For electrical adjustments (RF, AF, and switching position) and operation check

Note: The KRV-52NE has or does not have Ver No. depending on new or old type as shown below. (New one has Ver No.)
Note that an adjusting method of X-value is different.



Contents:
KRV-52NE (NTSC)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	5 kHz full tracks

KRV-51N2 (NTSC)

Class	Mode	Time	Video	Audio (HIFI/Normal)
1	SP	7 min.	Color bar	400 Hz
2	SP	3 min.	Mono. scope	400 Hz
3	EP	7 min.	Color bar	400 Hz
4	EP	3 min.	Mono. scope	400 Hz

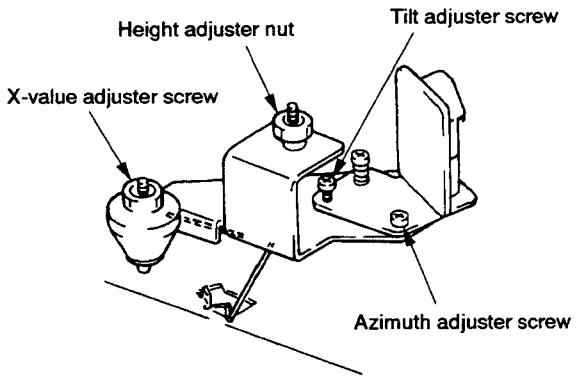
2-1. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having no version No.)

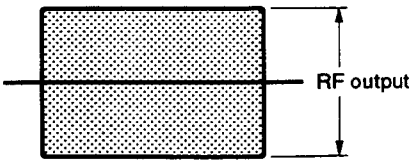
2-1-1. X-VALUE ADJUSTMENT (Using the tape having no version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC having no version No.)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw

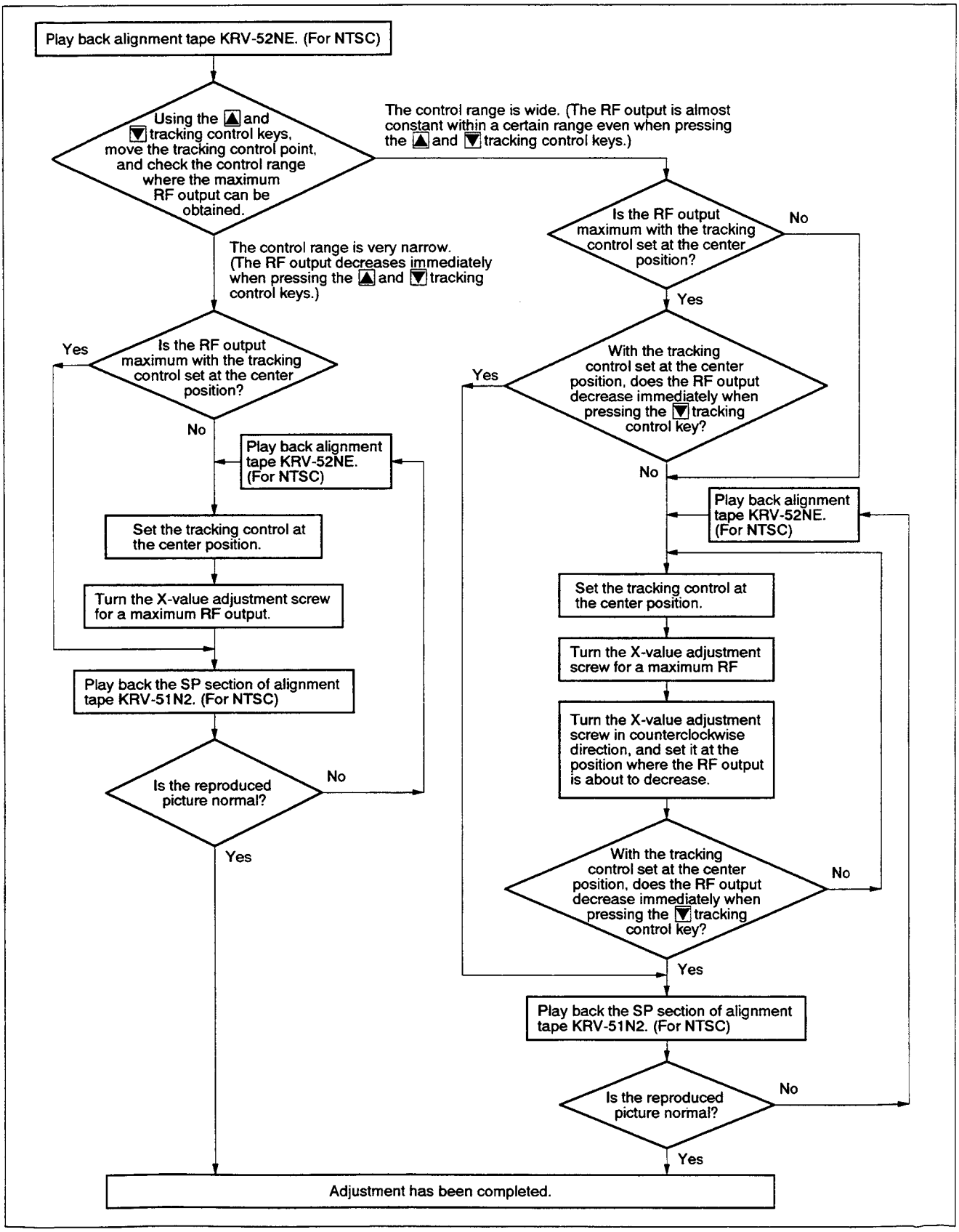




RF output shall be maximum at the center position of the tracking control.

[Adjustment Method]
Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

X-VALUE ADJUSTMENT (Using the tape having no version No.)


Play back alignment tape KRV-52NE. (For NTSC)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF output.
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
Yes
No
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
Yes
No
Adjustment has been completed.

When adjustment is complete, adjust the height of No. 3 and No. 6 guide rollers on page 10.

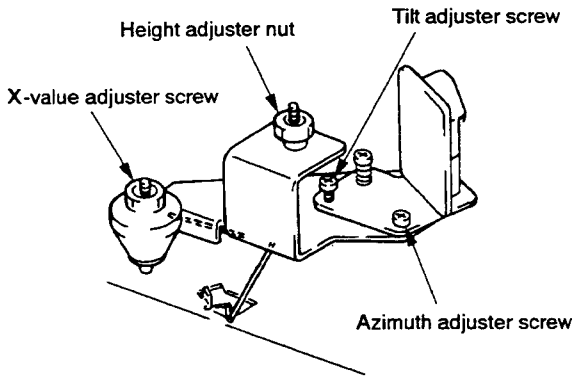
2-2. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having the version No.)

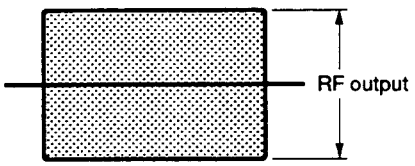
2-2-1. X-VALUE ADJUSTMENT (Using the tape having the version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC having the version No.)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw



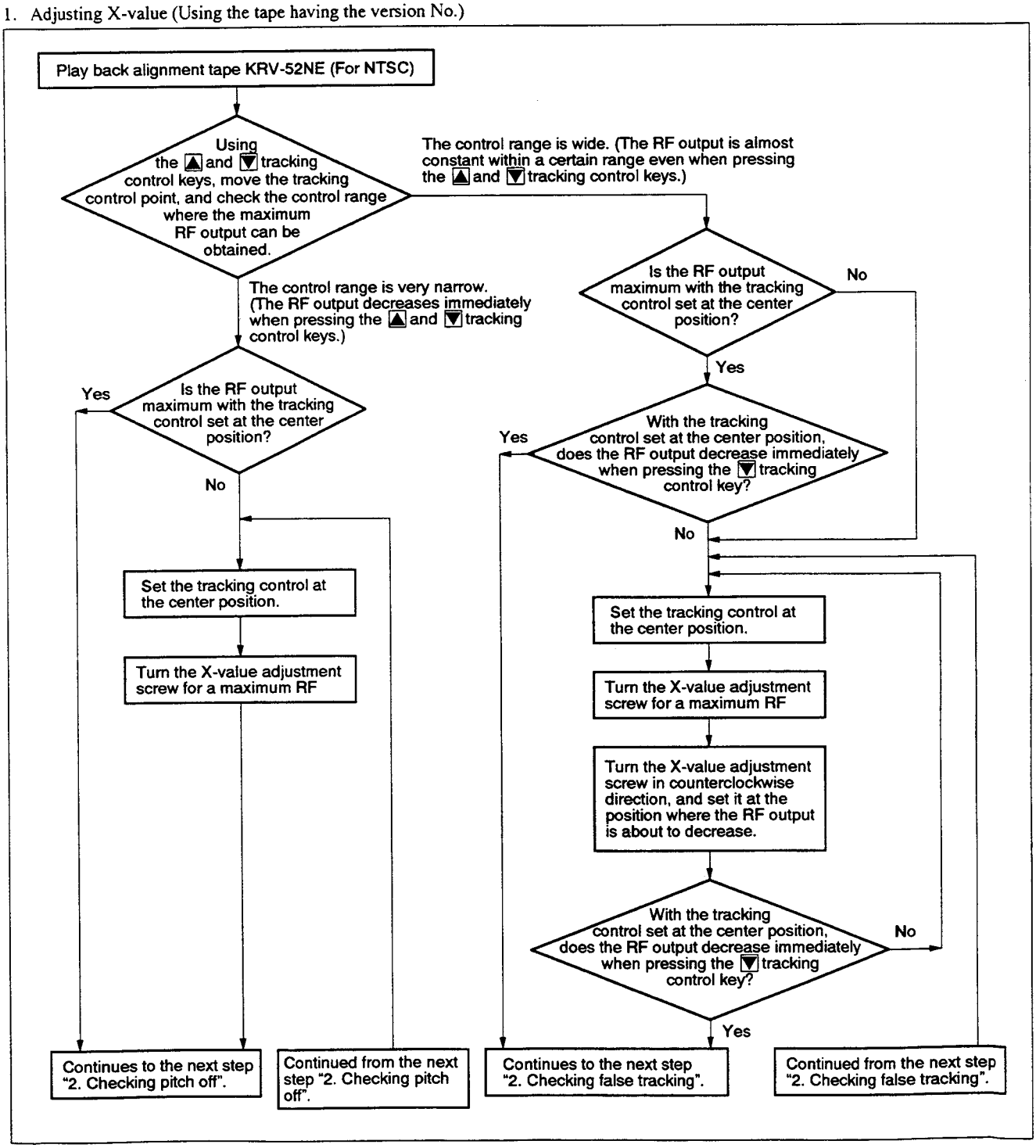


RF output shall be maximum at the center position of the tracking control.

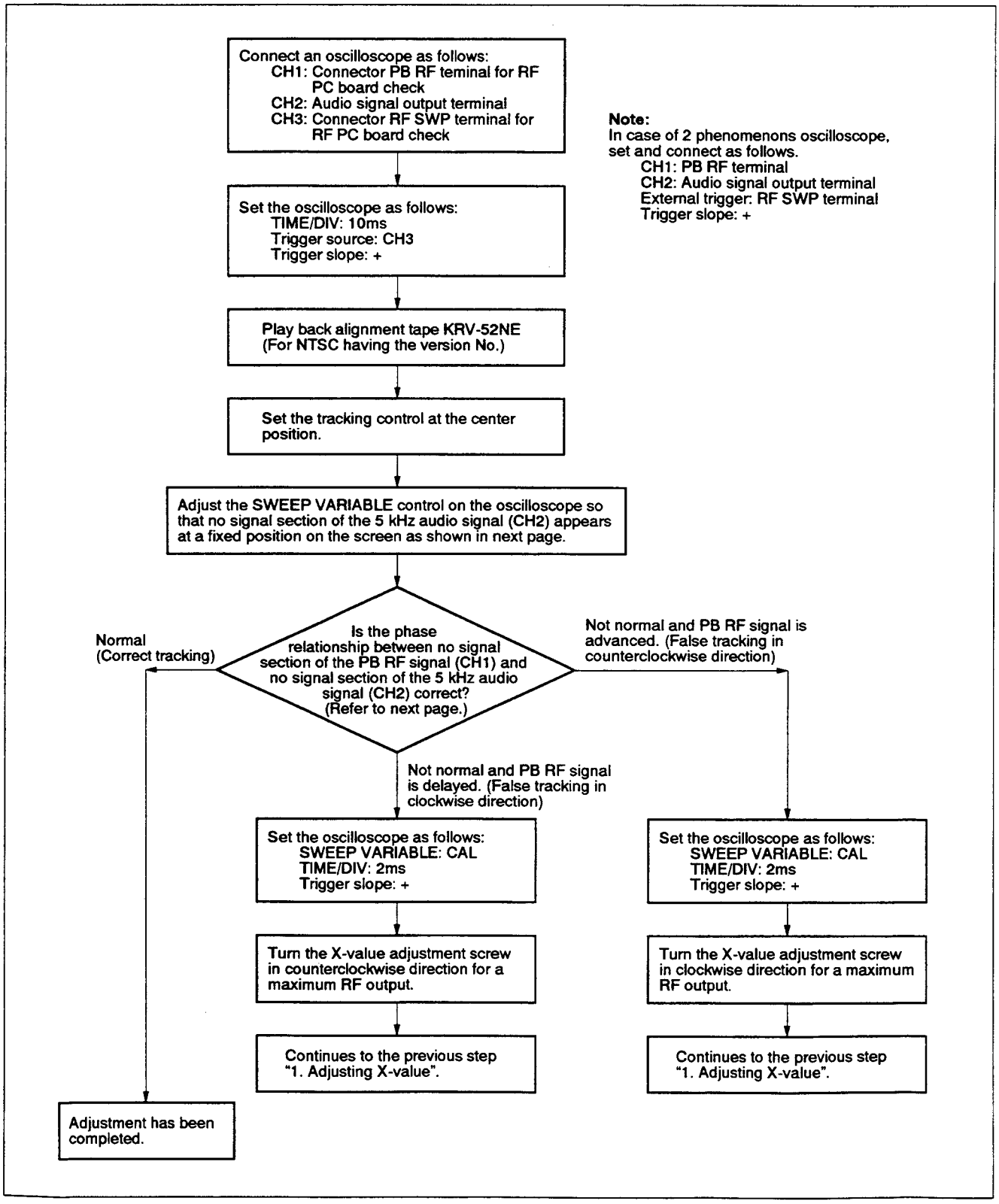
[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

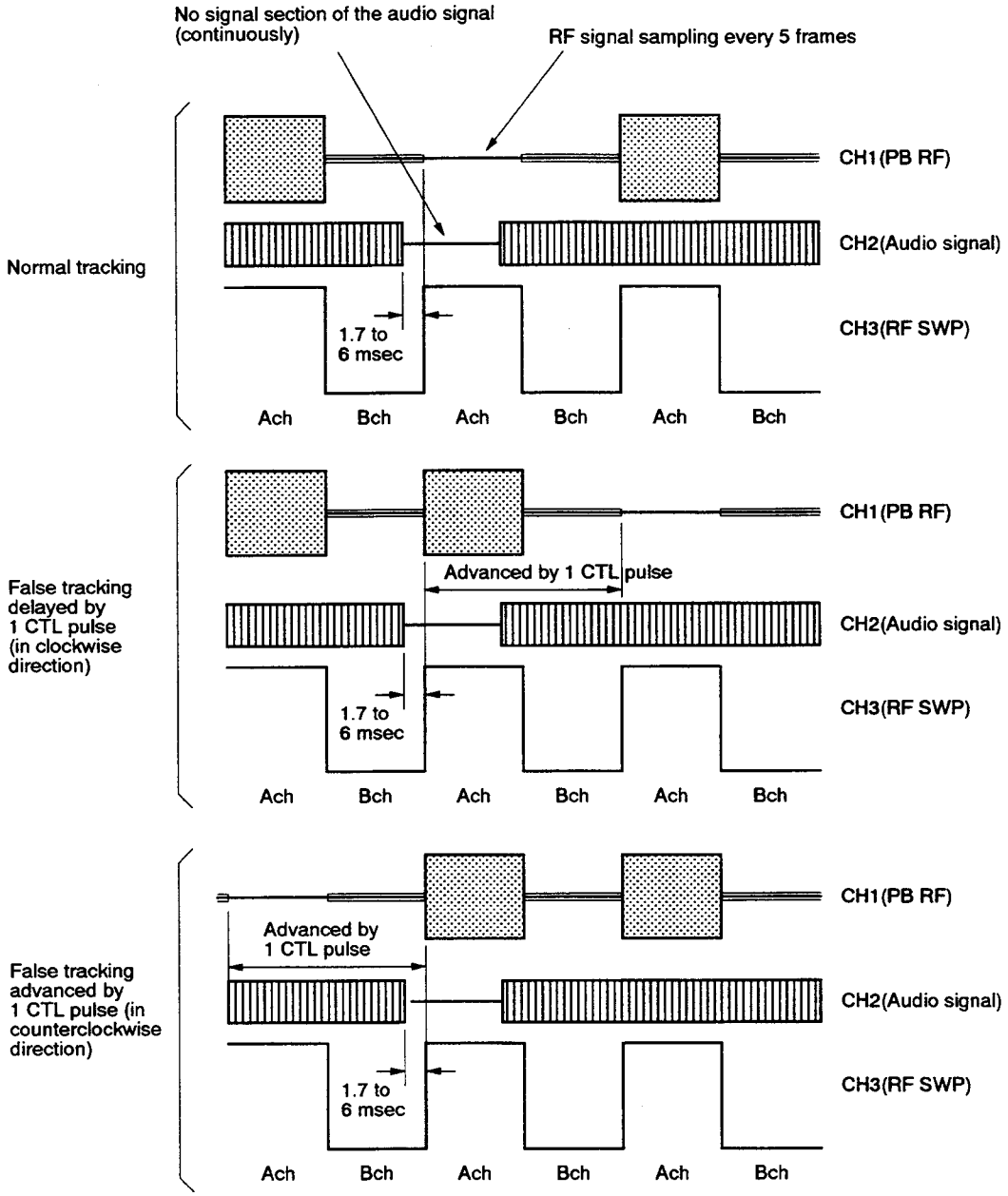
1. Adjusting X-value (Using the tape having the version No.)


Play back alignment tape KRV-52NE (For NTSC)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Is the RF output maximum with the tracking control set at the center position?
Yes
No
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Continues to the next step "2. Checking pitch off".
Continued from the next step "2. Checking pitch off".
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

2. Checking false tracking (Using the tape having the version No.)


Connect an oscilloscope as follows:
CH1: Connector PB RF teminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check
Note:
In case of 2 phenomenons oscilloscope, set and connect as follows.
CH1: PB RF terminal
CH2: Audio signal output terminal
External trigger: RF SWP terminal
Trigger slope: +
Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source: CH3
Trigger slope: +
Play back alignment tape KRV-52NE (For NTSC having the version No.)
Set the tracking control at the center position.
Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 5 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.
Is the phase relationship between no signal section of the PB RF signal (CH1) and no signal section of the 5 kHz audio signal (CH2) correct? (Refer to next page.)
Normal (Correct tracking)
Not normal and PB RF signal is advanced. (False tracking in counterclockwise direction)
Not normal and PB RF signal is delayed. (False tracking in clockwise direction)
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjustment screw in counterclockwise direction for a maximum RF output.
Continues to the previous step "1. Adjusting X-value".
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjustment screw in clockwise direction for a maximum RF output.
Continues to the previous step "1. Adjusting X-value".
Adjustment has been completed.

Using the tape having the version No.



2-3. ADJUSTING THE MECHANISM USING ALIGNMENT TAPE (KRV-52NE for NTSC)

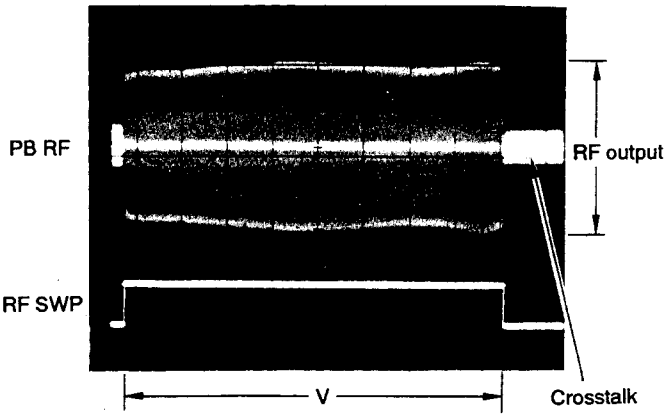
2-3-1. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No.3 tape guide roller Height adjustment screw for No.6 tape guide roller

[Adjustment Method]

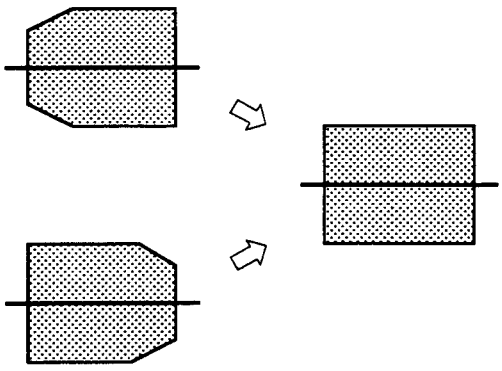
The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check".

1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).
2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).

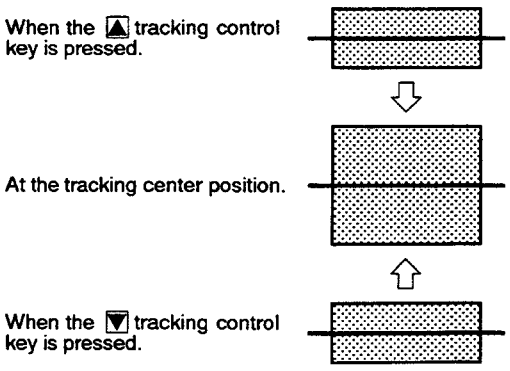


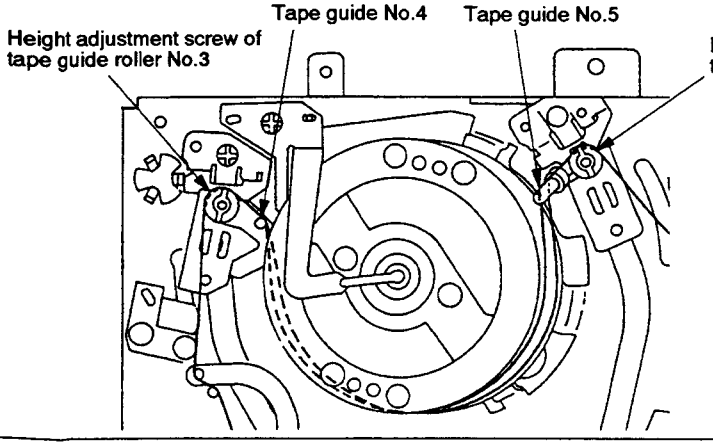
3) Turn the height adjustment screws of tape guide rollers No.3 and No.6 so that the RF output envelope becomes as flat as possible.
4) Press the ▲ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.
5) Press the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

Turn the height adjustment screws of tape guide rollers No.3 and No.6 little by little so that the RF output envelope becomes as flat as possible.



Press the ▼ tracking control key, then the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.




Tape guide No.4
Tape guide No.5
Height adjustment screw of tape guide roller No.3
Height adjustment screw of tape guide roller No. 6

2-3-2. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 2-1 and 2-2)

Purpose: Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Jig	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw and the height adjuster nut.
   (The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

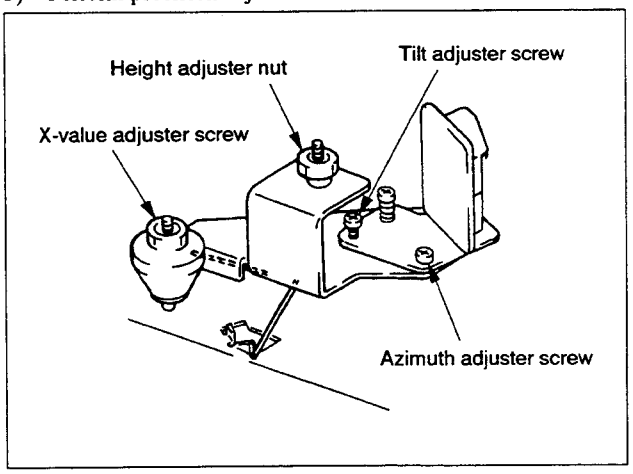


Fig. 2-1

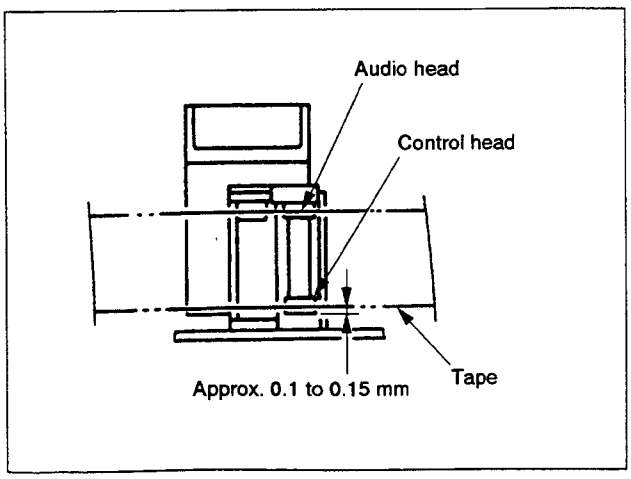


Fig. 2-2

2-3-3. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (KRV-52NE 5 kHz) (For NTSC)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

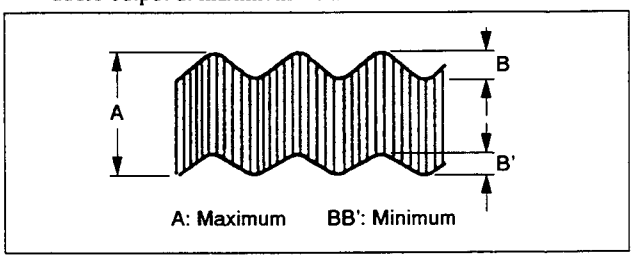


Fig. 2-3

2-3-4. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

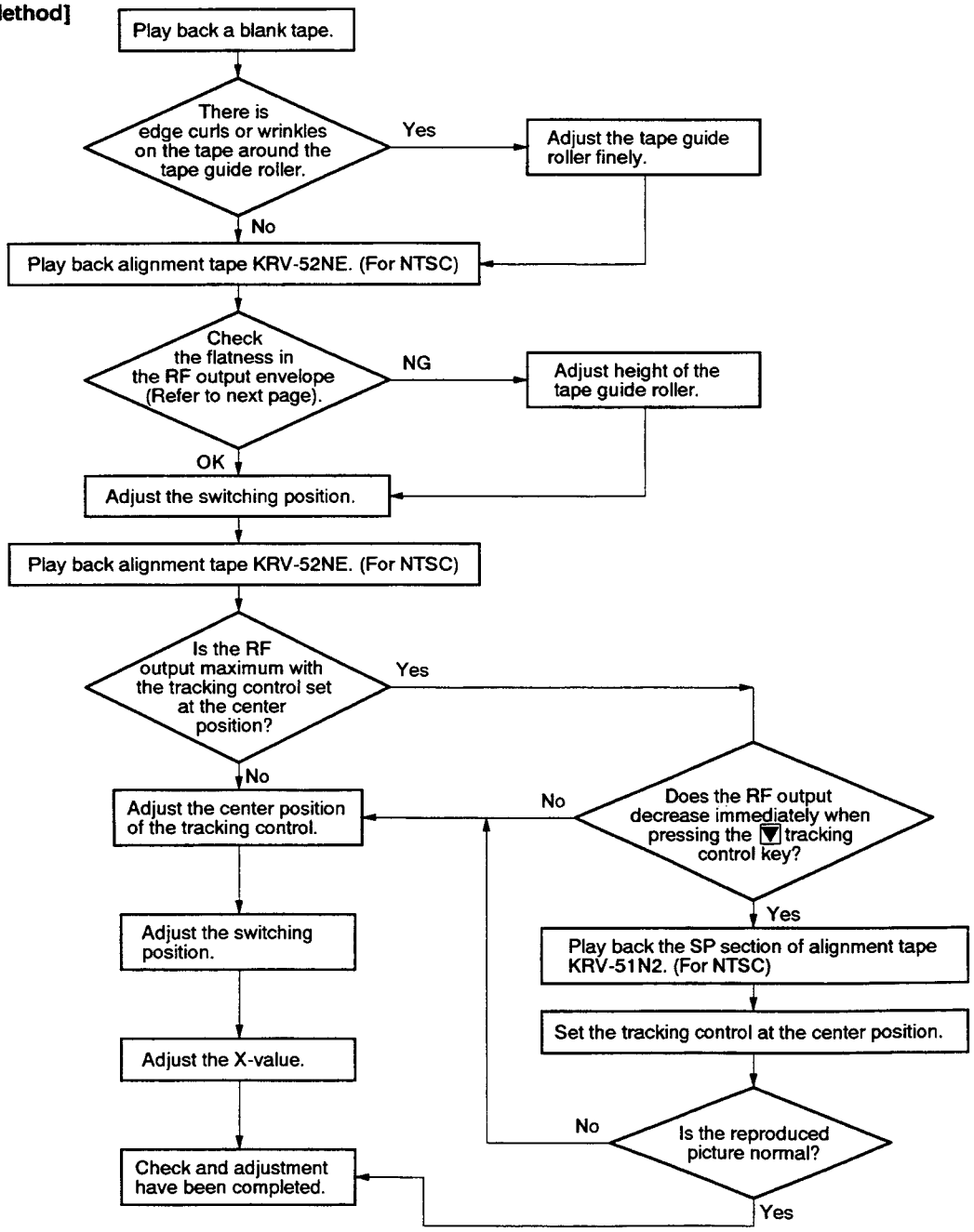
Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Note 1: Deactivate the automatic tracking control for setting the mechanism in manual tracking control mode.

Note 2: To set the tracking control at the center position, deactivate the automatic tracking control by pressing the tracking [AUTO/MANUAL] key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

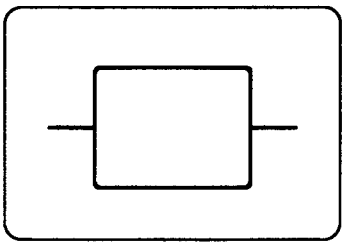
Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC), blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SWP pin for RF PC board check.
Adjustment locations	Guide roller (Refer to 2-3-1.) Switching position (Refer to the Service Manual) X-value (Refer to 2-1-1, 2-1-2.)

[Adjustment Method]

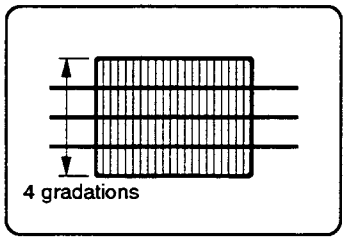

Play back a blank tape.
There is edge curls or wrinkles on the tape around the tape guide roller.
Yes
Adjust the tape guide roller finely.
No
Play back alignment tape KRV-52NE. (For NTSC)
Check the flatness in the RF output envelope (Refer to next page).
NG
Adjust height of the tape guide roller.
OK
Adjust the switching position.
Play back alignment tape KRV-52NE. (For NTSC)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Adjust the center position of the tracking control.
No
Does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Set the tracking control at the center position.
Adjust the switching position.
Adjust the X-value.
No
Is the reproduced picture normal?
Check and adjustment have been completed.
Yes

[Checking the evenness and fluctuation of the RF output]

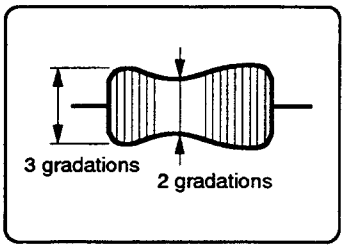
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

VHS MECHANICAL ADJUSTMENT MANUAL IV

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VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY®
SERVICE MANUAL

H MECHANISM

SUPPLEMENT-2

File this supplement with the VHS mechanical adjustment IV and supplement-1.

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1. CORRECTION

In the VHS Mechanism Adjustment Manual IV (Supplement-1), an adjustment sequence was wrong, and it is corrected as follow;

1-1. Adjustment Sequence (VHS Mechanism Adjustment Manual IV (Supplement-1) Page 6 to11)

(1) Adjustment of No. 3 and No. 6 guide roller height
Delete the "The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check" under "Adjustment Method" on page 10.

(2) Adjustment of ACE head assembly

Note: In the adjustment of ACE head assembly (coarse adjustment and fine adjustment), if a azimuth, height and tilt were adjusted, again adjust the height of No. 3 and No. 6 guide rollers.

(3) Adjustment of X value

MICROFILM

2. MODIFICATION

2-1. CHANGING THE RECORDED CONTENTS OF ALIGNMENT TAPE

KRV-52NE (NTSC) (Ver. 1.2)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	5 kHz → 4 kHz full tracks

2-2. TG2 ROLLER, FE HEAD ASSEMBLY (Refer to VHS Mechanical Adjustment Manual IV page14)

- The TG2 roller is provided with either of two types, fixed or straight. For the fixed type, section 3-5 is added.

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove screw ① to pull out FE head assembly ②.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller.

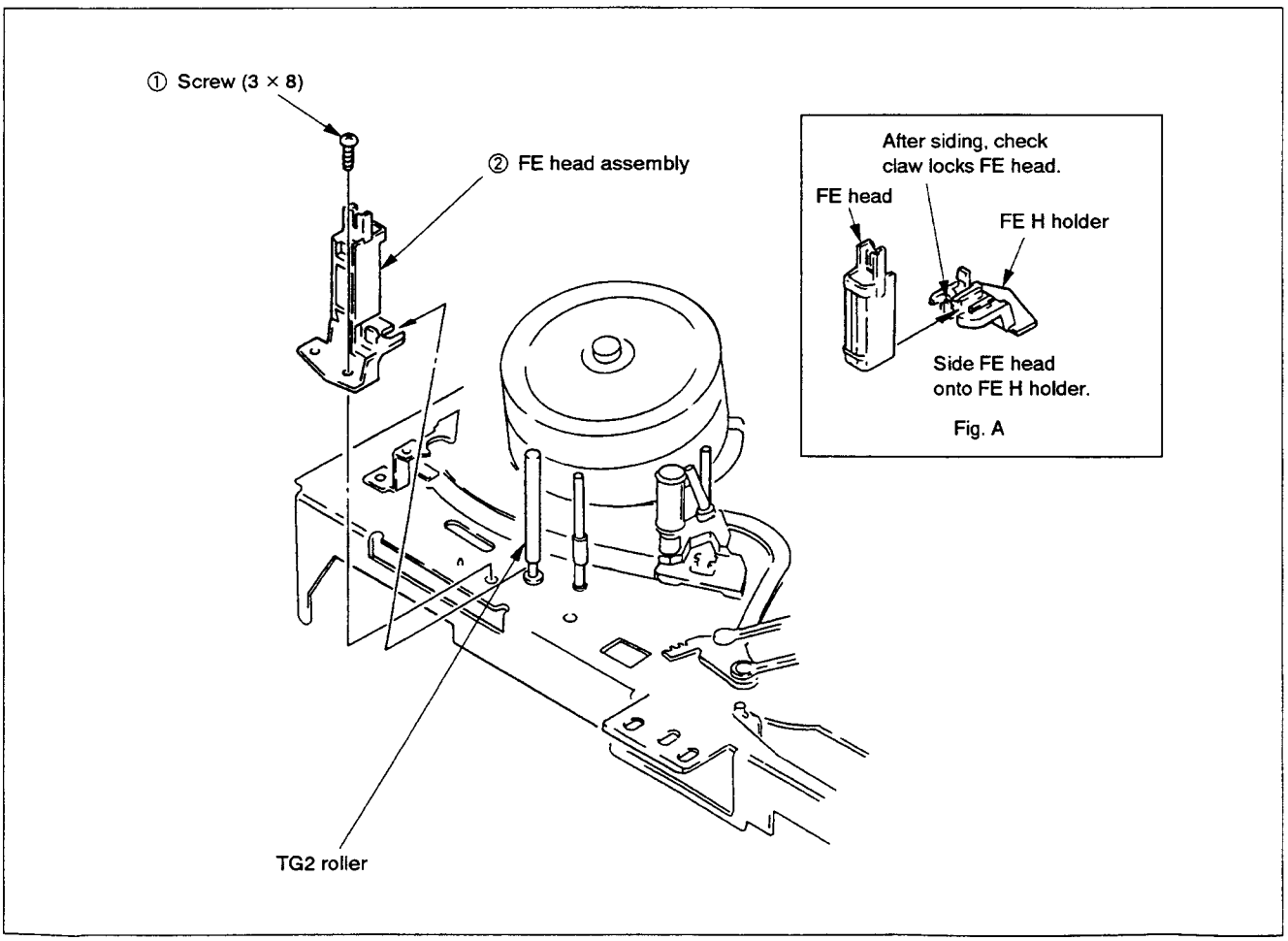
① Screw (3 × 8)
② FE head assembly
TG2 roller
After siding, check claw locks FE head.
FE head
FE H holder
Side FE head onto FE H holder.
Fig. A

Fig. 3-5

2-3. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Refer to VHS Mechanical Adjustment Manual Ⅳ page 17)

- There is another type in TG3 and TG6 guide roller assemblies, which is not attached with a screw (B2X3). For the screwless type, section 3-8 is added.

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

1) TG3 guide roller assembly ① by turning it in arrow Ⓐ direction.
2) Removal the spring ②.
3) TG6 guide roller assembly ③ by turning it in arrow Ⓑ direction.
4) Removal the spring ④.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ①, ③.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

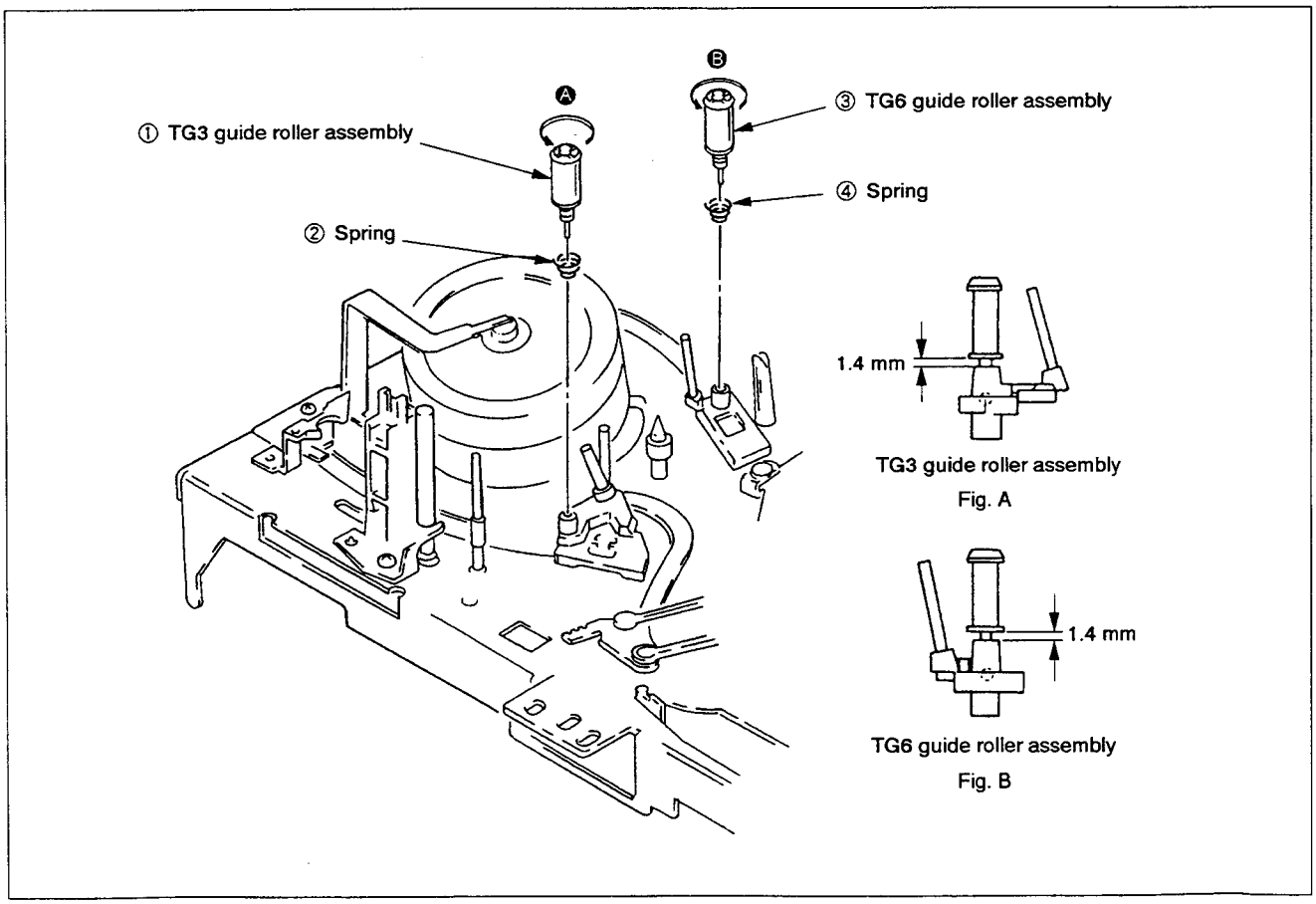

Fig. 3-8

2-4. TG8 ASSEMBLY (Refer to VHS Mechanical Adjustment Manual Ⅳ page 23)

- As the shape of TG8 assembly was changed, Section 3-13 is changed.

☛ : Chenged portion

3-13. TG8 ASSEMBLY (Fig. 3-15)

1) Remove TG7 tape retainer ① to pull out TG8 assembly ②.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG7 tape retainer ①.
- After attaching the TG7 tape retainer ①, check that side Ⓐ of ① is below side Ⓑ of the stepped-part of the TG7 shaft. (Fig. A)

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

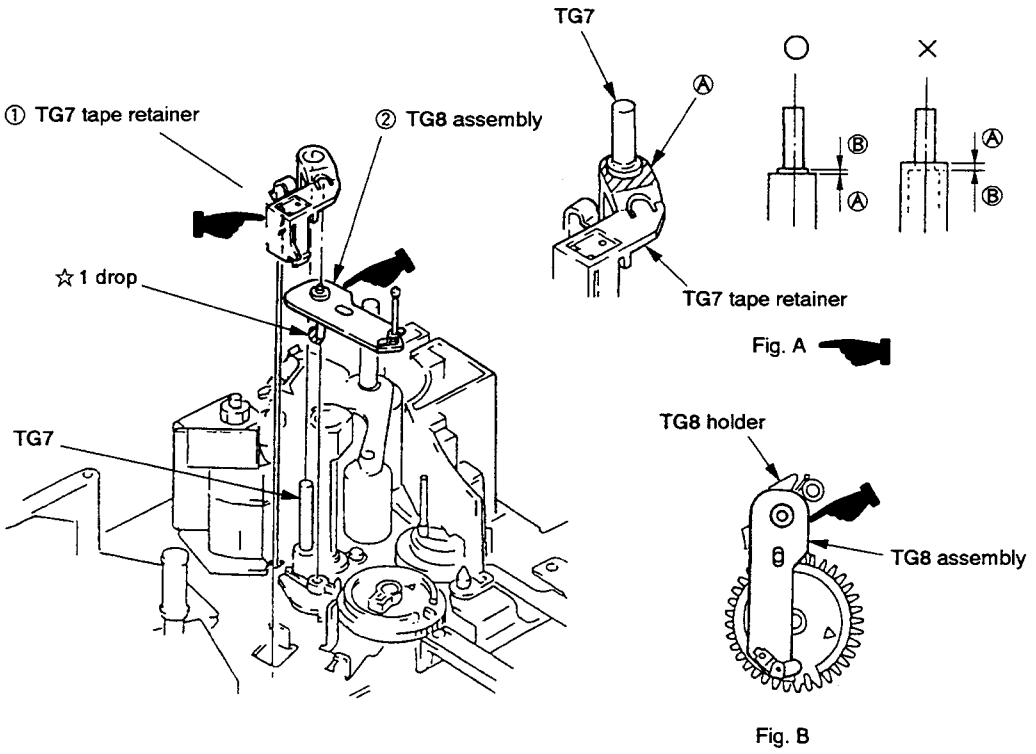

Fig. 3-15

2-5. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual Ⅳ page 35)

- As the tension regulator position and tension adjustment were changed, the tension adjustment and Fig. 4-1 are changed.

☛ : Changed portion

• Tension adjustment

Mode	Playback
Measuring instrument/tool	Torque cassette
Adjustment locations	Position for hooking the tension spring
Specified value	34 ± 4 g•cm ☛

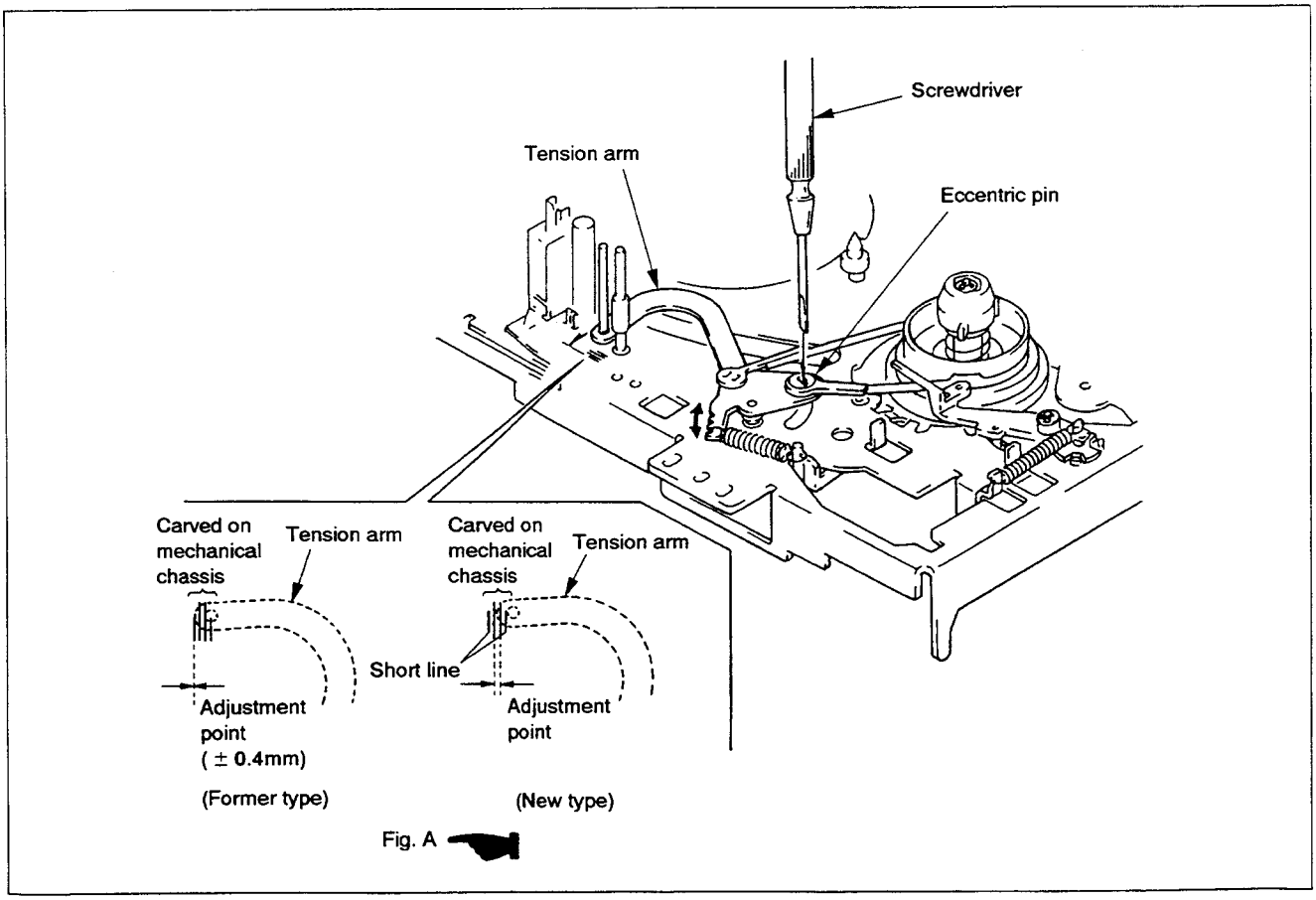

Fig. 4-1

2-6. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual IV page 36)

- As the use of TG8 height adjusting screw was cancelled, section 4-1-2 is changed.

4-1-2. TG7 TAPE PATH ADJUSTMENT (Fig. 4-2)

[Adjustment Method]

1) Load a tape, and playback the tape in the CUE mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape (Fig. A).
2) Then, feeding the tape in the REV mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape.
3) If the tape height in the REV feed is higher that in the CUE playback (Fig. B), rotate the ACE head flapping adjust screw in the direction Ⓐ so that a difference in tape height between CUE mode and REV mode becomes zero.
4) If the tape height in the REV feed is lower that in the CUE playback (Fig. C), rotate the ACE head flapping adjust screw in the direction Ⓑ so that a difference in tape height between CUE mode and REV mode becomes zero.

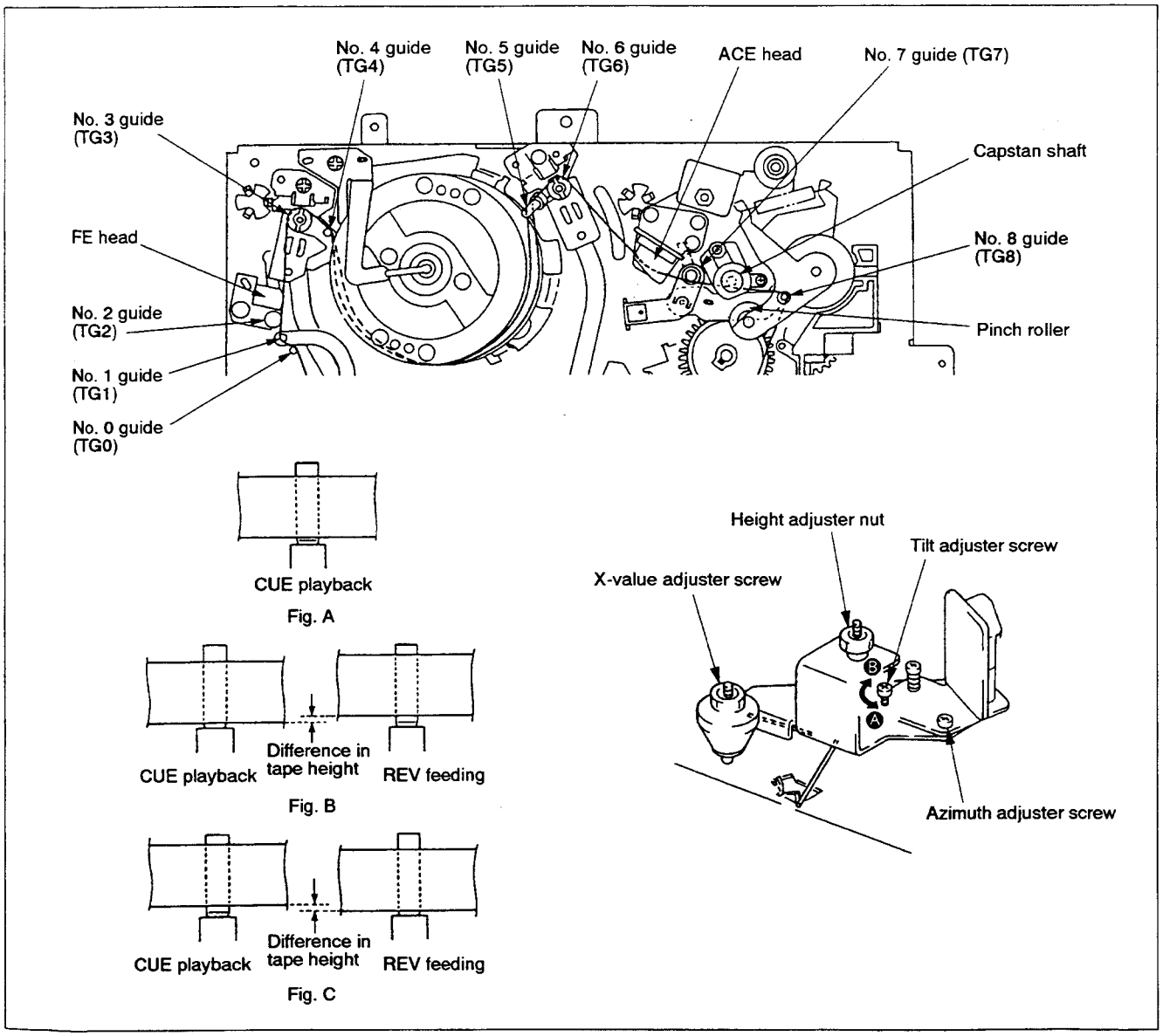

Fig. 4-2

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